



NEXCOM International Co., Ltd.

IoT Automation Solutions Business Group

PICMG Single Board Computer (PICMG 1.3)

PEAK 980

User Manual

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PREFACE

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Disclaimer

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Acknowledgements

PEAK 980 is a trademark of NEXCOM International Co., Ltd. All other product names mentioned herein are registered trademarks of their respective owners.

Regulatory Compliance Statements

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

Declaration of Conformity

FCC

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

CE

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

RoHS Compliance



NEXCOM RoHS Environmental Policy and Status Update

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

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

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

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

How to recognize NEXCOM RoHS Products?

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

All new product models launched after January 2006 will be RoHS compliant. They will use the usual NEXCOM naming convention.

Warranty and RMA

NEXCOM Warranty Period

NEXCOM manufactures products that are new or equivalent to new in accordance with industry standard. NEXCOM warrants that products will be free from defect in material and workmanship for 2 years, beginning on the date of invoice by NEXCOM.

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.

System Level

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

Board Level

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

Warnings

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

Cautions

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

Safety Information

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

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

Installation Recommendations

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

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

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

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

Safety Precautions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a stable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection to protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Place the power cord in a way so that people will not step on it. Do not place anything on top of the power cord. Use a power cord that has been approved for use with the product and that it matches the voltage and current marked on the product's electrical range label. The voltage and current rating of the cord must be greater than the voltage and current rating marked on the product.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following situations arises, get the equipment checked by service personnel:
 - a. The power cord or plug is damaged.
 - b. Liquid has penetrated into the equipment.
 - c. The equipment has been exposed to moisture.
 - d. The equipment does not work well, or you cannot get it to work according to the user's manual.
 - e. The equipment has been dropped and damaged.
 - f. The equipment has obvious signs of breakage.
15. Do not place heavy objects on the equipment.
16. The unit uses a three-wire ground cable which is equipped with a third pin to ground the unit and prevent electric shock. Do not defeat the purpose of this pin. If your outlet does not support this kind of plug, contact your electrician to replace your obsolete outlet.
17. **CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER. DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.**

Technical Support and Assistance

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

Warning!

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

Conventions Used in this Manual



Warning:

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



Caution:

Information to avoid damaging components or losing data.



Note:

Provides additional information to complete a task easily.

Global Service Contact Information

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Package Contents

Before continuing, verify that the PEAK 980 package that you received is complete. Your package should have all the items listed in the following table.

Item	Name	Qty
1	PEAK980 Serial MB	1
2	USB Cable ST:QW-6609013 USB CONx2+Bracket to Dupont 2x5P PIT:2.54mm L=300mm	1
3	SATA 7P 180D(Lock) to 7P 180D(Lock) 26AWG L:500mm	2
4	DB9(M)x2+Bracket to Housing 1x10P PIT:1.0mm L=250mm	1

Optional Accessories

Item	Part Number	Name
1	603DVI0008X00	DVI-I Y cable



Note: The heatspreader acts as a thermal coupling device to the module and is thermally coupled to the CPU via a thermal gap filler. On some modules, it may also be thermally coupled to other heat generating components with the use of additional thermal gap fillers. Although the heatspreader is the thermal interface where most of the heat generated by the module is dissipated, it is not to be considered as a heatsink. It has been designed as a thermal interface between the module and the application specific thermal solution.

Ordering Information

The following information below provides ordering information for PEAK 980.

PEAK 980 ((P/N: 10P00098000X0)

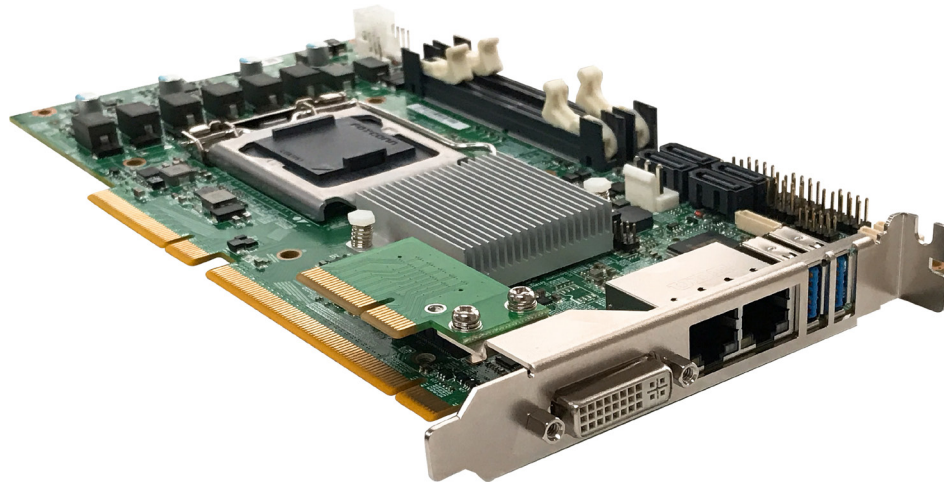
ATX, Intel® 8th/9th Coffee lake Core™ I TDP65W), Q370,
LGA1151, 2x DDR4 up to 32GB, DVI-I, DP, 2 x USB 3.1 (Gen1),
6x USB2.0, 2x GbE LAN, 4x SATAIII, 3x RS232,
1x RS232/422/485, 1x PCIe 60pin connector(EBK-980PCIE), 1x M.2.

PEAK980-H (P/N:10P00098001X0)

ATX, Intel® 8th/9th Coffee lake Core™ I TDP65W), H310,
LGA1151, 2x DDR4 up to 32GB, DVI-I, DP , 2 x USB 3.1 (Gen1),
6x USB2.0, 2x GbE LAN, 4x SATAIII, 3x RS232, 1x RS232/422/485.

CHAPTER 1: PRODUCT INTRODUCTION

Overview



Key Features

- Intel® 8th/9th Generation (Coffee Lake-S, Coffee Lake-S Refresh) Core™ i9/i7/i5/i3, Pentium 14nm LGA 1151 socket processor, MAX Qcta core: 65W, PCH Q370/H310
- 2x SO-DIMM DDR4 with non-ECC SO-DIMM 2666MHz up to 32GB
- Support triple display DVI-I (VGA+DVID) & DP
- 2x Intel® GbE LAN, 2x USB 3.1 (Gen 1), 6x USB 2.0, 3x RS232, 1x RS232/485/422, 4x SATA III
- 1x PCIe16, 1x PCIe4, 1x PCIe1, 1x PCIe 60-pin connector, 1x M.2 (2280 M-key)
- TPM (optional), WDT, DIO (4In/4Out)

Hardware Specifications

CPU Support

- 8th/9th generation Intel® Core™ i9/i7/i5/i3/Pentium LGA 1151 socket processor, MAX Qcta core: 65W

Main Memory

- 2x DDR4 SO-DIMM memory socket with non-ECC support, up to 32GB 2666MHz

Platform Control Hub

- Intel® Q370/H310 (co-design) Express Chipset

BIOS

- AMI (UEFI)

Display

- 1x DVI-I connector
VGA: (resolution up to 1920x1080@60Hz)
DVI-D: (resolution up to 1920x1080@60Hz).
- 1xDP connector (resolution up to 4096x2160@24Hz/3840x2160@60Hz)

System

- 2x USB3.1 (Gen 1), 6x USB2.0, 3x RS232, 1x RS232/485/422
- 1x Front panel header, digital I/O (4In/4Out), WDT.
- Supports TPM 2.0 (optional)
- 2x Fan connector

Storage

- 4x SATA III (6.0Gb/s) ports [support RAID 0/1/5/10 by Q370 only]
- 1x M.2 2280 M-key (PCIex4/SATA3) [by Q370 only]

Expansion Slot

- 1x PCIex16 (Gen 3) signal form processor
- 1x PCIex4, 1x PCIex1 (signal form PCH)
- 1x PCIe 60pin connector, (2x PCIex4 + 1xPCIex1) [by Q370 only]
- 1x M.2 2280 M-key (PCIex4/SATA) [by Q370 only]

Rear I/O

- 2x USB3.1 (Gen 1)
- 2xRJ45
 - 1x Intel® PHY i219LM Giga LAN (supports Intel® AMT 12.0)
 - 1x Intel® i211AT Giga LAN
- 1x DVI-I connector

Internal I/O

- 6x USB2.0
- 3x Serial ports 3x RS232, 1x RS232/485/422 (by COM2)
- 1x Digital I/O interface (4In/4Out)

Power Requirements

- Power source from Backplane through Golden Finger and AUX +12V 2x2 connector

Dimensions

- PICMG1.3 Form Factor, 8.9" x 4.9" (228mmx126mm)

Environment

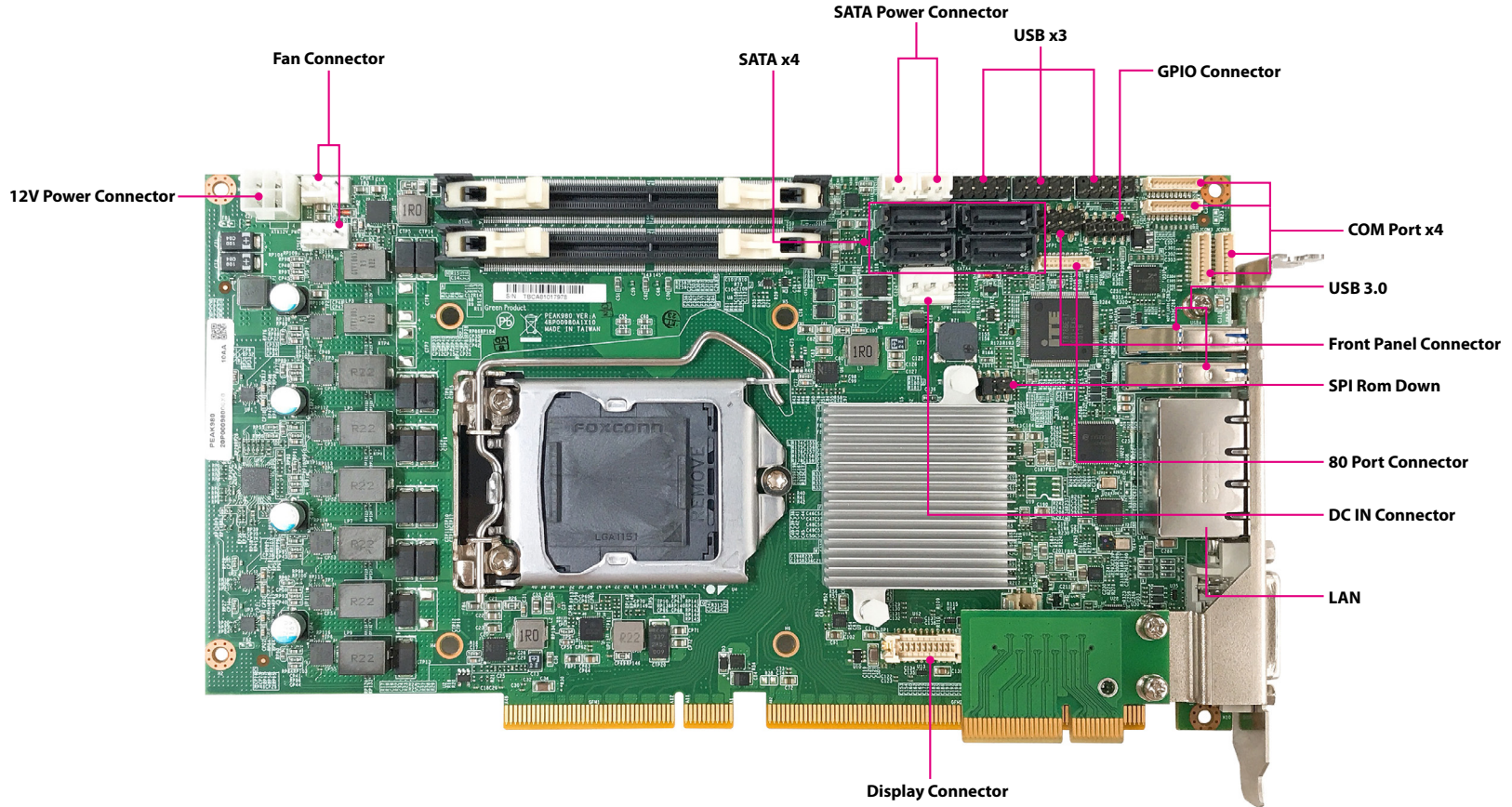
- Board level operating temperatures: 0°C to 60°C
- Storage temperatures: -40°C to 85°C
- Relative humidity:
 - 10% to 95% (operating, non-condensing)
 - 5% to 95% (non-operating, non-condensing)

Certifications

- CE/ FCC Class A compliant

Knowing Your PEAK 980

Front View



CHAPTER 2: JUMPERS AND CONNECTORS

This chapter describes how to set the jumpers and connectors on the PEAK 980 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:

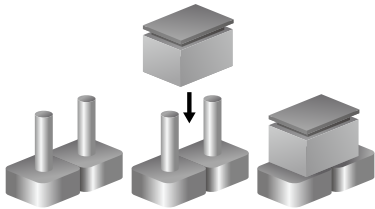
- Always disconnect the unit from the power outlet whenever you are working inside the case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal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

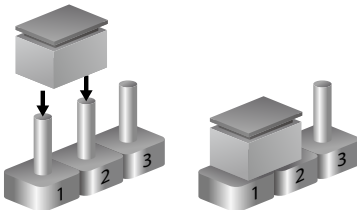
A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is short. If you remove the jumper cap, or place the jumper cap on just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

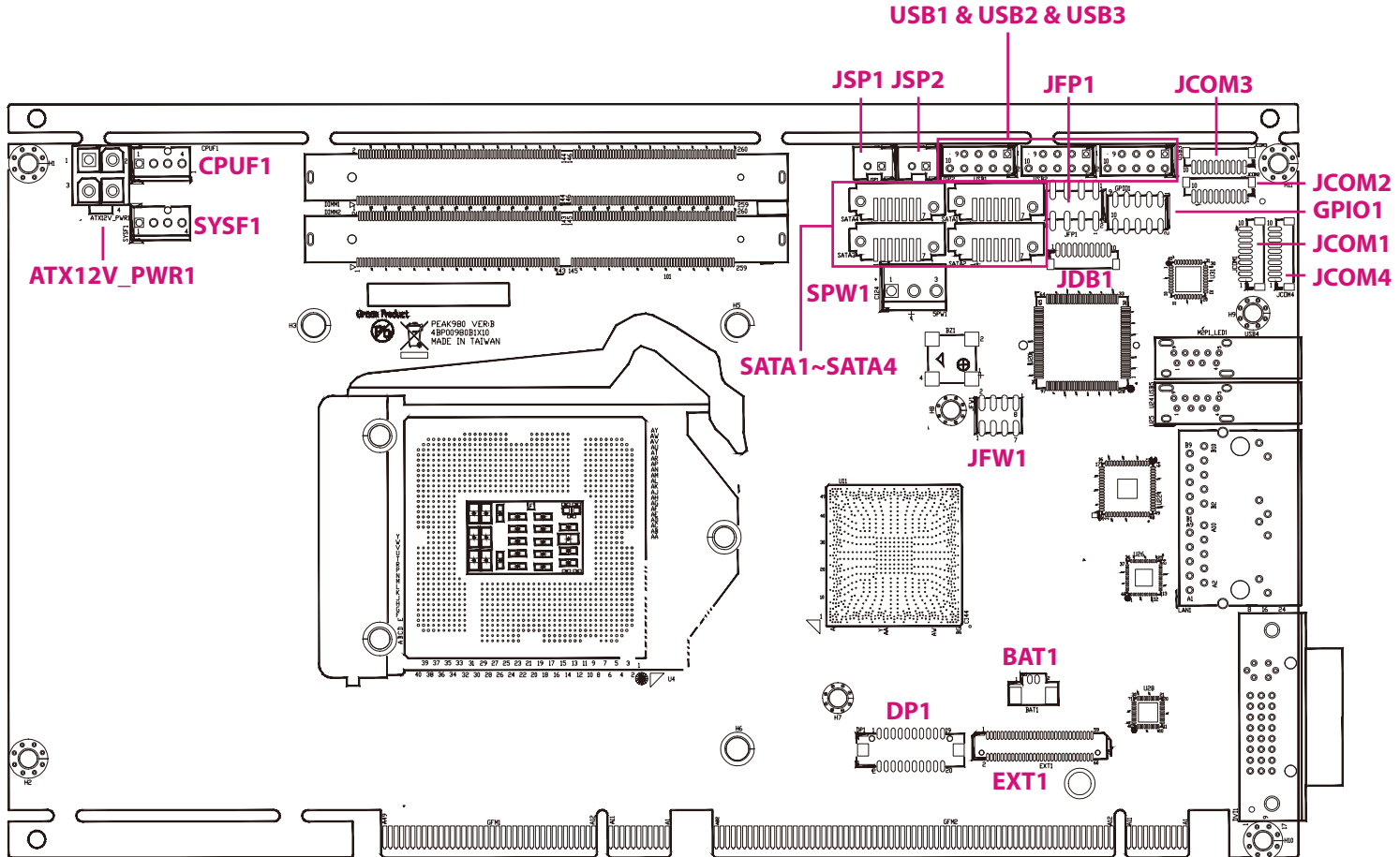


Three-Pin Jumpers: Pins 1 and 2 are Short



Locations of the Jumpers and Connectors

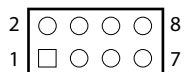
The figure below shows the location of the jumpers and connectors for PEAK 980.



Clean CMOS

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

Connector location: JFW1



Pin	Definition	Pin	Definition
1	NC	2	S_RTCRST#
3	+3V3_SPI	4	GND
5	SPI-CS#_R	6	SPI_CLK_R
7	SPI_DO_R	8	SPI_DI_R

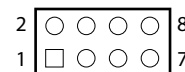
Pin	Settings
1-2 On	Normal
2-3 On	Clear CMOS

1-2 On: default

Front Panel Connector

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

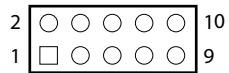
Connector location: JFP1



Pin	Definition	Pin	Definition
1	HDD_LED	2	PWR_LED
3	HDD_LED#	4	GND
5	GND	6	SHB_PWR_BTN#
7	SHR_RST_BTN#	8	GND

GPIO Connector

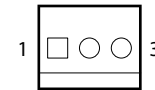
Connector type: 2x5 10-pin header, 2.0mm pitch
Connector location: GPIO1



Pin	Definition	Pin	Definition
1	+5VGPIO	2	GND
3	GP74(GPO0)	4	GPIO70(GP10)
5	GP75(GPO1)	6	GPIO71(GP11)
7	GP76(GPO2)	8	GPIO72(GP12)
9	GP77(GPO3)	10	GPIO73(GP13)

DC IN Connector

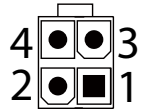
Connector type: 1x3 3-pin header, 3.96mm pitch
Connector location: 5PW1



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

12V Power Connector

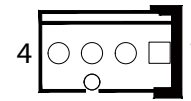
Connector type: 2x2 4-pin header, 3.5mm pitch
Connector location: ATX12V_PWR1



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

Fan Connector

Connector type: 1x4 4-pin header, 2.54mm pitch
Connector location: CPUF1

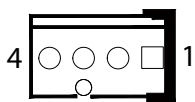


Pin	Definition	Pin	Definition
1	GND	2	+12V
3	FANIN1	4	FANOUT1

Fan Connector

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

Connector location: SYSF1

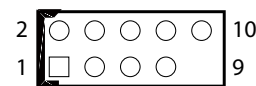


Pin	Definition	Pin	Definition
1	GND	2	+12V
3	FANIN2	4	FANOUT2

USB Connector

Connector type: 10-1-pin header, 2.54mm pitch

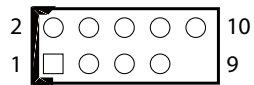
Connector location: USB1



Pin	Definition	Pin	Definition
1	+5V_USB2_78	2	+5V_USB2_78
3	USB2N_7	4	USB2N_8
5	USB2P_7	6	USB2P_8
7	GND	8	GND
9		10	NC

USB Connector

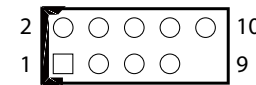
Connector type: 10-1-pin header, 2.54mm pitch
Connector location: USB2



Pin	Definition	Pin	Definition
1	+5V_USB2_78	2	+5V_USB2_78
3	USB2N_5	4	USB2N_6
5	USB2P_5	6	USB2P_6
7	GND	8	GND
9		10	NC

USB Connector

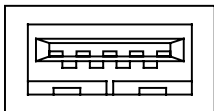
Connector type: 10-1-pin header, 2.54mm pitch
Connector location: USB3



Pin	Definition	Pin	Definition
1	+5V_USB2_34	2	+5V_USB2_34
3	USB2N_9	4	USB2N_3
5	USB2P_9	6	USB2P_3
7	GND	8	GND
9		10	NC

USB 3.0 Connector

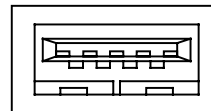
Connector type: USB 3.0 port, Type
Connector location: USB4



Pin	Definition	Pin	Definition
1	P5V_OC01_C	2	USB_1N_C
3	USB_1P_C	4	GND
5	USB3_RX1_N	6	USB3_RX1_P
7	GND	8	USB3_TX1_N
9	USB3_TX1_P		

USB 3.0 Connector

Connector type: USB 3.0 port, Type
Connector location: USB5

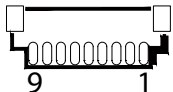


Pin	Definition	Pin	Definition
1	P5V_OC01_C	2	USB_2N_C
3	USB_2P_C	4	GND
5	USB3_RX2_N_C	6	USB3_RX2_P_C
7	GND	8	USB3_TX2_N_C
9	USB3_TX2_P_C		

COM Port Connector

Connector type: 1x9 9-pin header

Connector location: JCOM1

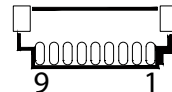


Pin	Definition	Pin	Definition
1	COM_DCD#1	2	COM_RXD1
3	COM_TXD1	4	COM_DTR#1
5	GND	6	COM_DSR#1
7	COM_RTS#1	8	COM_CTS#1
9	COM_RI#1	10	+5V

COM Port Connector

Connector type: 1x9 9-pin header

Connector location: JCOM2

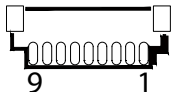


Pin	Definition	Pin	Definition
1	COM_DCD#2	2	COM_RXD2
3	COM_TXD2	4	COM_DTR#2
5	GND	6	COM_DSR#2
7	COM_RTS#2	8	COM_CTS#2
9	COM_RI#2	10	+5V

COM Port Connector

Connector type: 1x9 9-pin header

Connector location: JCOM3

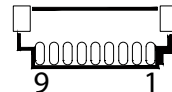


Pin	Definition	Pin	Definition
1	COM_DCD#3	2	COM_RXD3
3	COM_TXD3	4	COM_DTR#3
5	GND	6	COM_DSR#3
7	COM_RTS#3	8	COM_CTS#3
9	COM_RI#3	10	+5V

COM Port Connector

Connector type: 1x9 9-pin header

Connector location: JCOM4

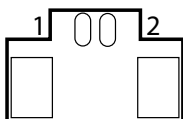


Pin	Definition	Pin	Definition
1	COM_DCD#4	2	COM_RXD4
3	COM_TXD4	4	COM_DTR#4
5	GND	6	COM_DSR#4
7	COM_RTS#4	8	COM_CTS#4
9	PWR_RI#_COM4	10	+5V

RTC Backup Battery Connector

Connector type: 1x2 2-pin header, 1.25mm MALE 180D SMD

Connector location: BAT1

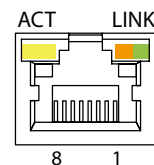


Pin	Definition
1	GND
2	3V_BAT

LAN1 Port

Connector type: RJ45 with LEDs

Connector location: LAN1A



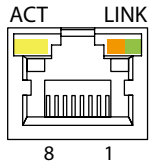
Act	Status
Flashing Yellow	Data activity
Off	No activity

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

Pin	Definition	Pin	Definition
A1	MDIO+	A2	MDIO-
A3	MDI1+	A4	MDI1-
A5	MDI2+	A6	MDI2-
A7	MDI3+	A8	MDI-
A9	T_VCC	A10	GND
A11	LAN1_LINK	A12	LAN1_LED_100#
A13	LAN1_LED_ACT#	A14	LAN1_ACT_P

LAN2 Port

Connector type: RJ45 with LEDs
Connector location: LAN1B



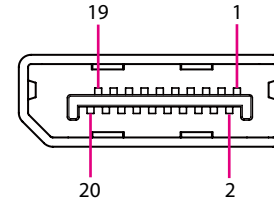
Act	Status
Flashing Yellow	Data activity
Off	No activity

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

Pin	Definition	Pin	Definition
B1	LAN2_MDI0P	B2	LAN2_MDI0N
B3	LAN2_MDI1P	B4	LAN2_MDI1N
B5	LAN2_MDI2P	B6	LAN2_MDI2N
B7	LAN2_MDI3P	B8	LAN2_MDI3N
B9	T_VCC	B10	GND
B11	LAN2_LINK	B12	LAN2_LED_100#
B13	LAN2_LED_ACT#	B14	LAN2_ACT_P

Display Connector

Connector type: DisplayPort
Connector location: DP1



Pin	Definition	Pin	Definition
1	+3V_DP_PWR	2	+3V3_DP_PWR
3	GND	4	GND
5	LANE1_N	6	LANE3_N
7	LANE1_P	8	LANE3_P
9	GND	10	GND
11	LANEO_N	12	LANE2_N
13	LANEO_P	14	LANE2_P
15	GND	16	GND
17	AUX_P	18	HPD
19	AUX_N	20	GND

SATA Connector

Connector type: SATA-M-180

Connector location: SATA1



Pin	Definition	Pin	Definition
1	GND	2	SATA_TXP3
3	SATA_TXN3	4	GND
5	SATA_RXN3	6	SATA_RXP3
7	GND		

SATA Connector

Connector type: SATA-M-180

Connector location: SATA2



Pin	Definition	Pin	Definition
1	GND	2	SATA_TXP2
3	SATA_TXN2	4	GND
5	SATA_RXN2	6	SATA_RXP2
7	GND		

SATA Connector

Connector type: SATA-M-180

Connector location: SATA3

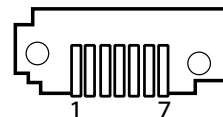


Pin	Definition	Pin	Definition
1	GND	2	SATA_TXP0
3	SATA_TXN0	4	GND
5	SATA_RXN0	6	SATA_RXP0
7	GND		

SATA Connector

Connector type: SATA-M-180

Connector location: SATA4

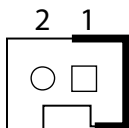


Pin	Definition	Pin	Definition
1	GND	2	SATA_TXP1
3	SATA_TXN1	4	GND
5	SATA_RXN1	6	SATA_RXP1
7	GND		

SATA Power Connector

Connector type: 1x2 2-pin header

Connector location: JSP1 and JSP2

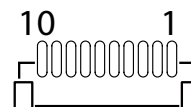


Pin	Definition
1	+5V
2	GND

80 Port Connector

Connector type:

Connector location: JDB1

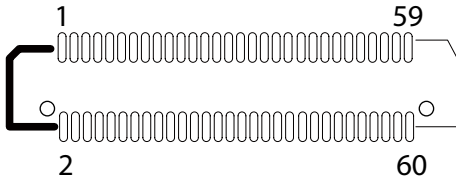


Pin	Definition	Pin	Definition
1	GND	2	PLTRST#_BUFF_1
3	CLKOUT_LPC1	4	LFRAME#
5	LPC_D3	6	LPC_D2
7	LPC_D1	8	LPC_D0
9	SERIRQ_R	10	+3V3

High Speed Connector

Connector type:

Connector location: EXT1



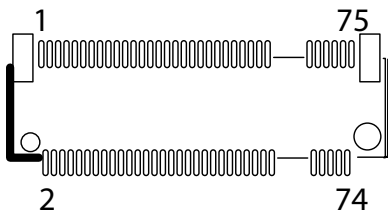
Pin	Definition	Pin	Definition
1	S_PCIE_TXP1	2	S_PCIE_RXP1
3	S_PCIE_TXN1	4	S_PCIE_RXN1
5	GND	6	GND
7	S_PCIE_TXP2	8	S_PCIE_RXP2
9	S_PCIE_TXN2	10	S_PCIE_RXN2
11	GND	12	GND
13	S_PCIE_TXP3	14	S_PCIE_RXP3
15	S_PCIE_TXN3	16	S_PCIE_RXN3
17	GND	18	GND
19	S_PCIE_TXP4	20	S_PCIE_RXP4
21	S_PCIE_TXN4	22	S_PCIE_RXN4
23	GND	24	GND
25	S_PCIE_TXP21	26	S_PCIE_RXP21

Pin	Definition	Pin	Definition
27	S_PCIE_TXN21	28	S_PCIE_RXN21
29	GND	30	GND
31	S_PCIE_TXP22	32	S_PCIE_RXP22
33	S_PCIE_TXN22	34	S_PCIE_RXN22
35	GND	36	GND
37	S_PCIE_TXP23	38	S_PCIE_RXP23
39	S_PCIE_TXN23	40	S_PCIE_RXN23
41	GND	42	GND
43	S_PCIE_TXP24	44	S_PCIE_RXP24
45	S_PCIE_TXN24	46	S_PCIE_RXN24
47	GND	48	GND
49	PCH_PCIE_TXP13	50	S_PCIE_RXP10
51	PCH_PCIE_TXN13	52	S_PCIE_RXN10
53	GND	54	GND
55	REFCLK_P12	56	REFCLK_P13
57	REFCLK_N12	58	REFCLK_N13
59	WAKE_N_R	60	RST_N_R

M.2 M Key Connector

Connector type:

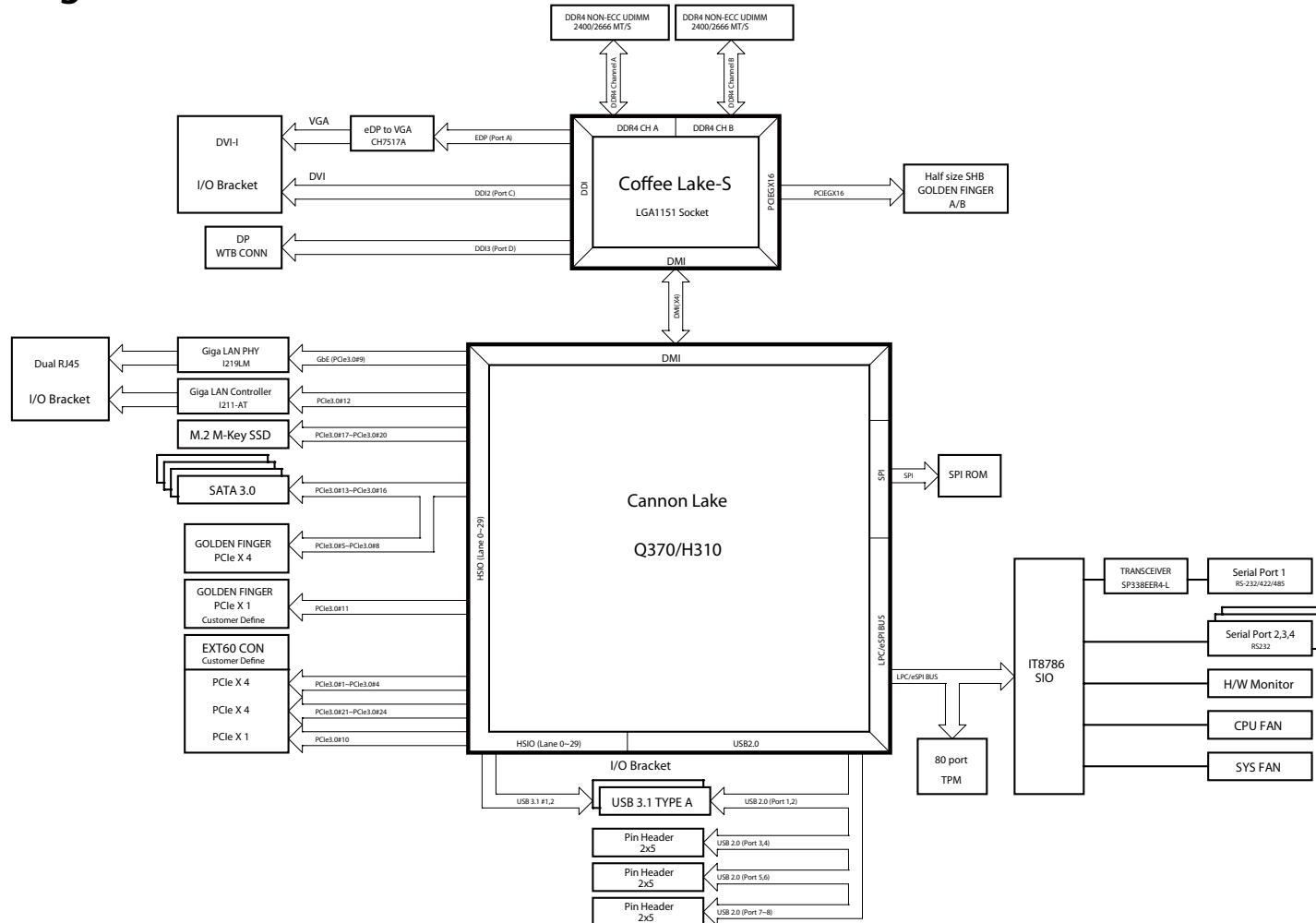
Connector location: NGFF1



Pin	Definition	Pin	Definition
1	GND	2	+3VSB
3	GND	4	+3VSB
5	S_PCIE_RXN20	6	NC
7	S_PCIE_RXP20	8	NC
9	GND	10	DSS#_1
11	PCIE_TXN20	12	+3VSB
13	PCIE_TXP20	14	+3VSB
15	GND	16	+3VSB
17	S_PCIE_RXN19	18	+3VSB
19	S_PCIE_RXP19	20	NC
21	GND	22	NC
23	PCIE_TXN19	24	NC
25	PCIE_TXP19	26	NC

Pin	Definition	Pin	Definition
27	GND	28	NC
29	S_PCIE_RXN18	30	NC
31	S_PCIE_RXP18	32	NC
33	GND	34	NC
35	PCIE_TXN18	36	NC
37	PCIE_TXP18	38	DEVSLP_0
39	GND	40	NC
41	S_PCIE_RXP17	42	NC
43	S_PCIE_RXN17	44	NC
45	GND	46	NC
47	PCIE_TXN17	48	NC
49	PCIE_TXP17	50	PERST#1
51	GND	52	SRCCLKREQ_N11
53	S_CLKOUT_PCIE_N11	54	PEWAKE_N1
55	S_CLKOUT_PCIE_P11	56	NC
57	GND	58	NC
67	NC	68	SUSCLK2
69	PEDET_1	70	+3VSB
71	GND	72	+3VSB
73	GND	74	+3VSB
75	GND		

Block Diagram



CHAPTER 3: BIOS SETUP

This chapter describes how to use the BIOS setup program for the PEAK 980. 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. Another way to enter Setup is to power on the computer and wait for the following message during the POST:

TO ENTER SETUP BEFORE BOOT PRESS + +

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

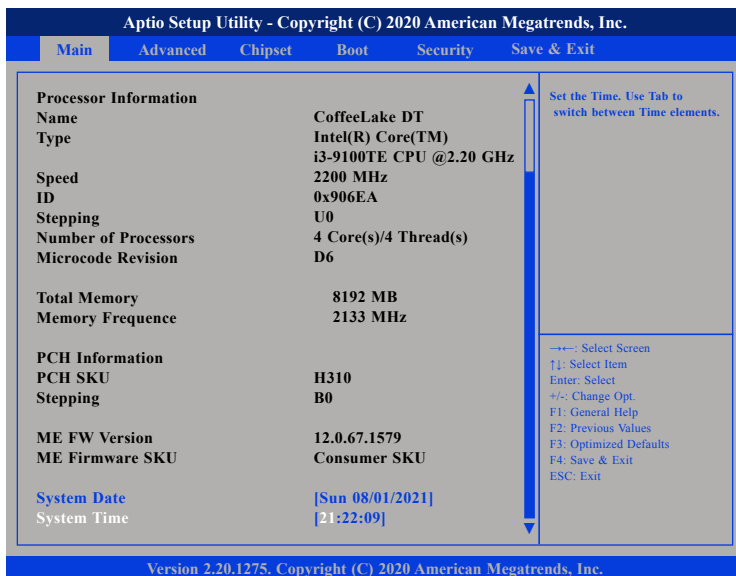
When “▶” appears on the left of a particular field, it indicates that a submenu which contains additional options are available for that field. To display the submenu, move the highlight to that field and press  .

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  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.



Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.

Main Advanced Chipset Boot Security Save & Exit

Processor Information		Set the Time. Use Tab to switch between Time elements. ←→: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Name	CoffeeLake DT	
Type	Intel(R) Core(TM) i3-9100TE CPU @2.20 GHz	
Speed	2200 MHz	
ID	0x906EA	
Stepping	U0	
Number of Processors	4 Core(s)/4 Thread(s)	
Microcode Revision	D6	
Total Memory	8192 MB	
Memory Frequency	2133 MHz	
PCH Information		
PCH SKU	H310	
Stepping	B0	
ME FW Version	12.0.67.1579	
ME Firmware SKU	Consumer SKU	
System Date	[Sun 08/01/2021]	
System Time	[21:22:09]	

Version 2.20.1275. Copyright (C) 2020 American Megatrends, Inc.

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.

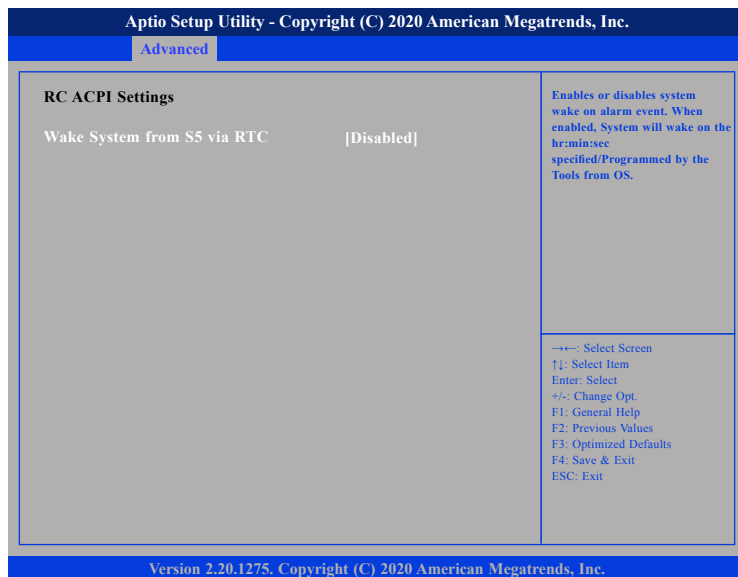


Setting incorrect field values may cause the system to malfunction.



RC ACPI Settings

This section is used to configure RC ACPI settings.

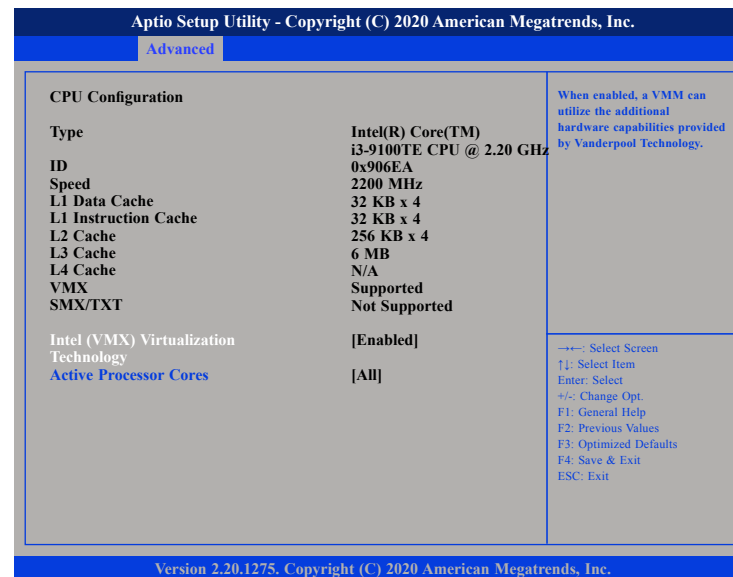


Wake System from S5

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

CPU Configuration

This section is used to configure the CPU.



Intel® 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.

CPU Power Management Control

This section is used to view CPU status and configure CPU parameters.



Intel® SpeedStep™

Enables or disables Intel SpeedStep.

Turbo Mode

Enables or disables turbo mode.

CPU C States

Enables or disables CPU C states.

PCH-FW Configuration

This section is used to configure the firmware update options.



ME State

Enables or disables ME state. When disabled, ME will be placed into ME Temporarily Disable Mode.

ME Unconfig on RTC Clear

When disabled, ME will not be unconfigured on RTC Clear.

Firmware Update Configuration

Enters the Firmware Update Configuration submenu.

Firmware Update Configuration



Me FW Image Re-Flash

Enables or disables the ME firmware image re-flash function.

Trusted Computing

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



Security Device Support

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

ACPI Settings

This section is used to configure ACPI settings.



Enable ACPI Auto Configuration

Enables or disables BIOS ACPI auto configuration

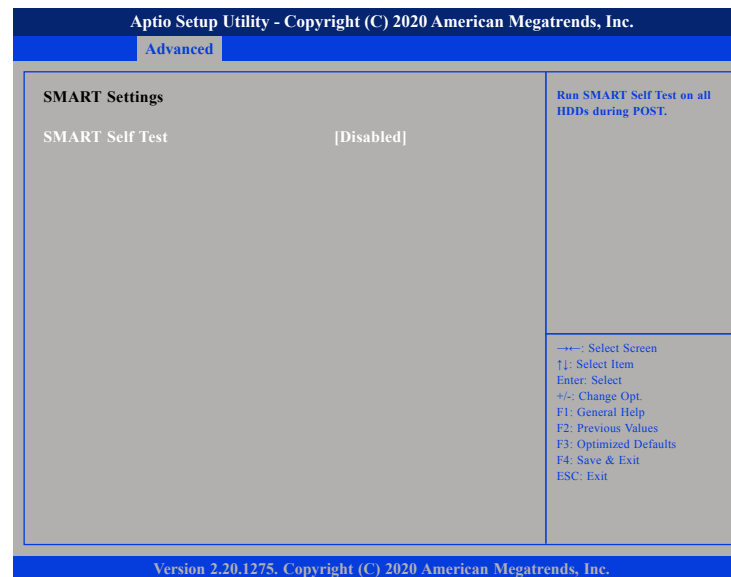
Enable Hibernation

Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.

ACPI Sleep State

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

SMART Settings

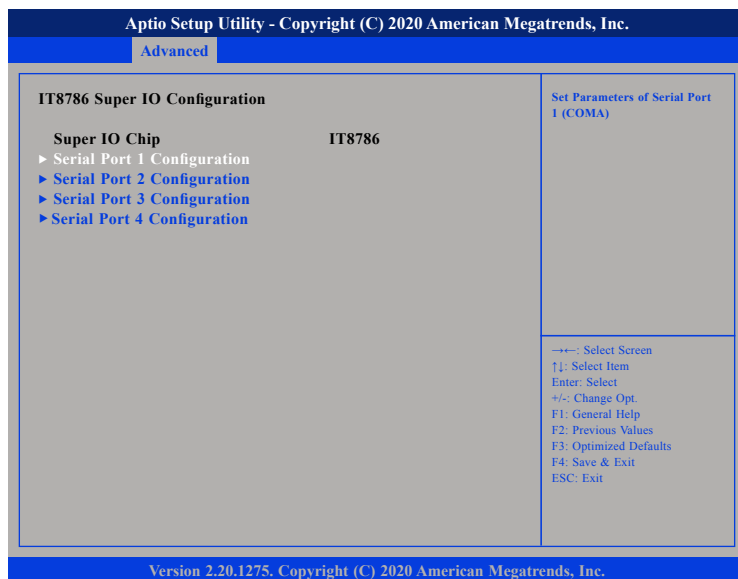


SMART Self Test

Run SMART self test on all HDDs during POST.

IT8786 Super IO Configuration

This section is used to configure the I/O functions supported by the onboard Super I/O chip.

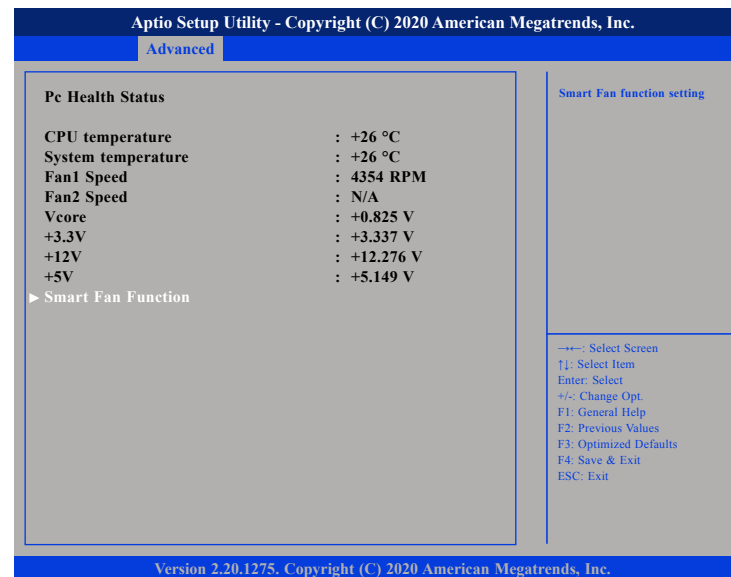


IT8783F Super IO Chip

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

H/W Monitor

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



CPU Temperature

Detects and displays the current CPU temperature.

System Temperature

Detects and displays the current temperature of system.

Fan1 Speed

Detects and displays system fan1 speed.

Fan2 Speed

Detects and displays system fan2 speed.

Vcore

Detects and displays the Vcore CPU voltage.

3.3V

Detects and displays 3.3V voltage.

12V

Detects and displays 12V voltage.

5V

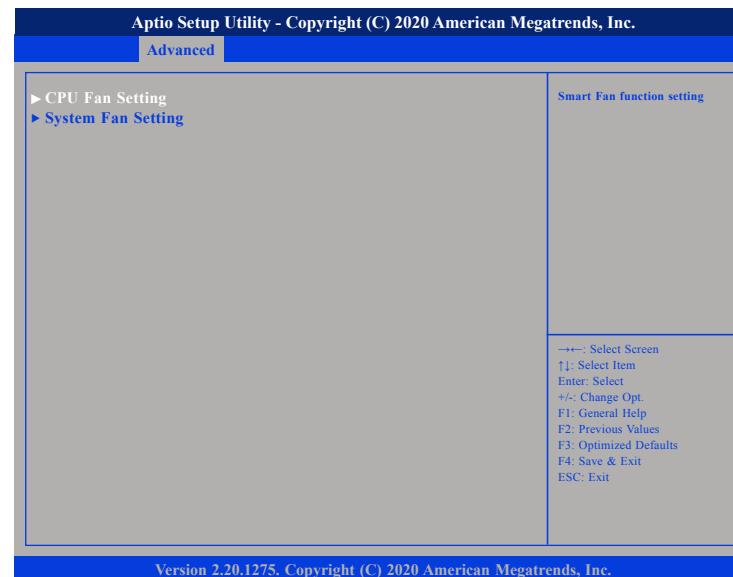
Detects and displays 5V voltage.

Smart fan function

Enables or disables smart fan function.

Smart Fan Function

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



CPU FAN Setting

Configures the smart fan function setting.

USB Configuration

This section is used to configure the USB.



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

Enables or disables USB mass storage driver support.

USB Transfer Time-out

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

Device Reset Time-out

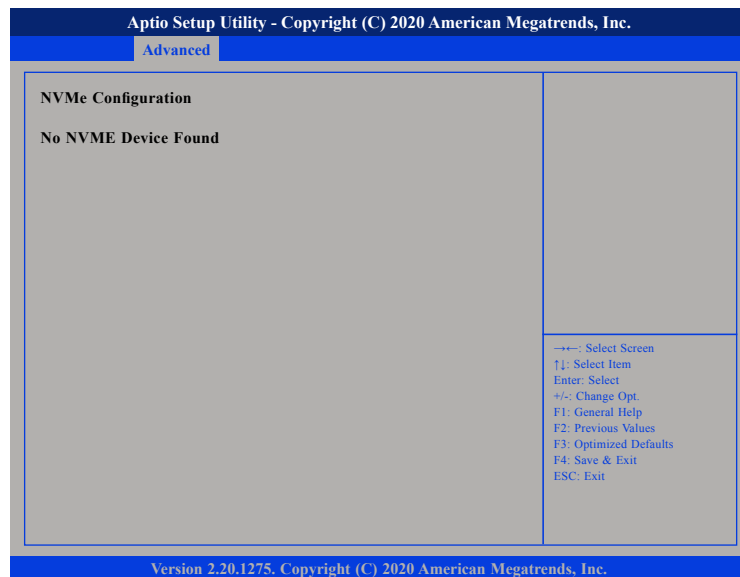
Selects the USB mass storage device's start unit command timeout.

Device Power-up Delay

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

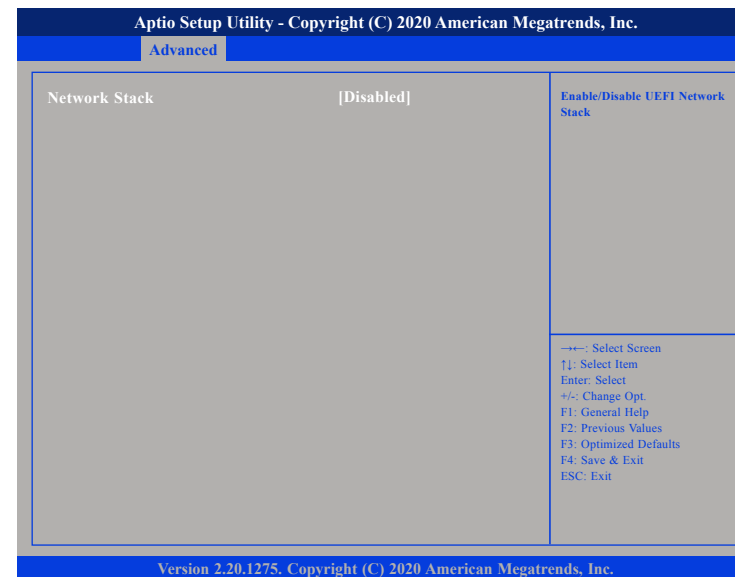
NVMe Configuration

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



Network Stack Configuration

This section is used to configure the network stack settings.

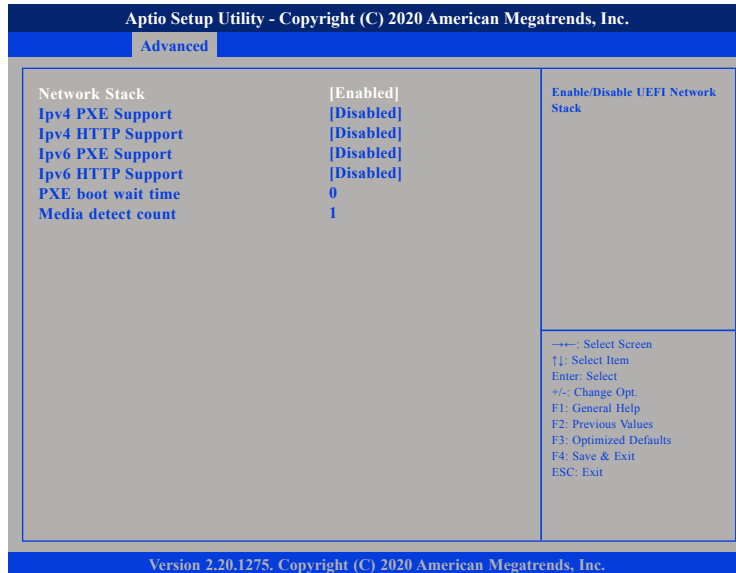


Network Stack

Enables or disables UEFI network stack.

Network Stack Configuration

This section is used to configure the network stack settings.



Network Stack

Enables or disables UEFI network stack.

Ipv4 PXE Support

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

Ipv4 HTTP Support

Enables or disables IPv4 HTTP support.

Ipv6 PXE Support

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

Ipv6 HTTP Support

Enables or disables IPv6 HTTP support.

PXE boot wait time

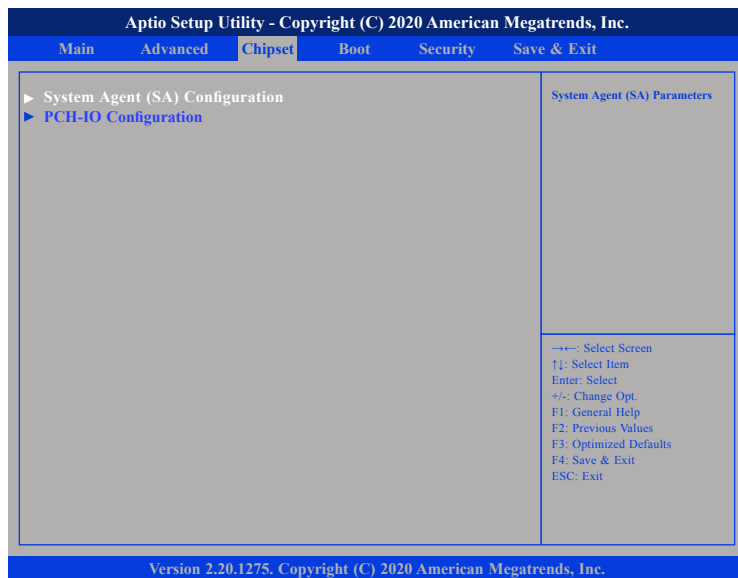
Configures the wait time to press the ESC key to abort the PXE boot.

Media detect count

Configures the number of times the media will be checked.

Chipset

This section is used to configure the system based on the specific features of the chipset.



Setting incorrect field values may cause the system to malfunction.

System Agent (SA) Configuration



VT-d

Enables or disables VT-d function on MCH.

Memory Configuration

Configures the memory settings.

Graphics Configuration

Configures the graphic chip settings.

PEG Port Configuration

Configures the PEG Port settings.

Memory Configuration

Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.		
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	0.7.1.113	
Memory Frequency	2133 Mhz	
Memory Timings (tCL-tRCD-tRP-tRAS)	15-15-15-36	
Channel 0 Slot 0	Not Populated/Disabled	
Channel 0 Slot 1	Not Populated/Disabled	
Channel 1 Slot 0	Populated/Enabled	
Size	8192 MB (DDR4)	
Channel 1 Slot 1	Not Populated/Disabled	
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.

Graphics Configuration

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Chipset		
Graphics Configuration		Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx.
Primary Display	[Auto]	
Internal Graphics	[Auto]	
GTT Size	[8MB]	
Aperture Size	[256MB]	
		→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.20.1275. Copyright (C) 2020 American Megatrends, Inc.		

Primary Display

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

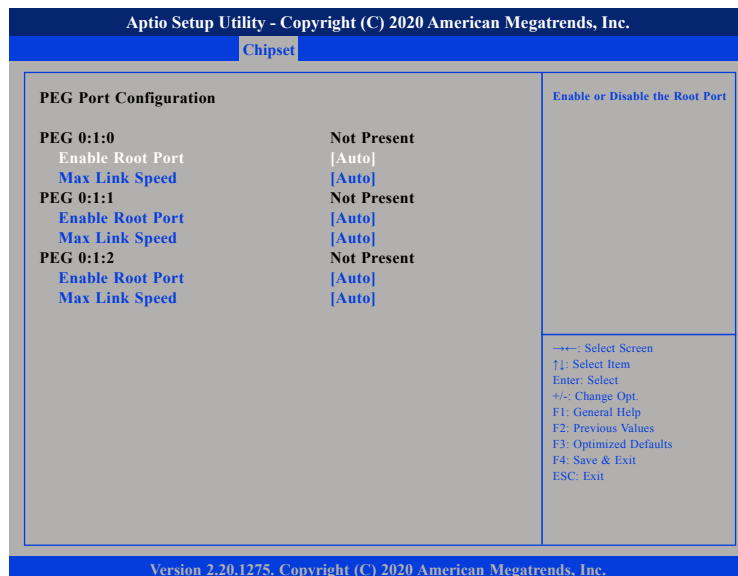
Internal Graphics

Keep IGD enabled based on the setup options.

GTT Size and Aperture Size

Configures the GTT memory size and the Aperture size.

PEG Port Configuration



Enable Root Port

Enables or disables the root port.

Max Link Speed

Select the maximum link speed of the PEG device.

PCH-IO Configuration

This section is used to configure PCH-IO configuration.



PCH LAN Controller

Enables or disables onboard NIC.

Wake on LAN

Enables or disables integrated LAN to wake the system.

Restore AC Power Loss

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

SATA and RST Configuration

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Chipset

SATA and RST Configuration

SATA Controller(s)	[Enabled]	Enable/Disable SATA Device.
SATA Mode Selection	[AHCI]	
SATA Test Mode	[Disabled]	
Serial ATA Port 0	Empty	
Software Preserve	Unknown	
Port 0	[Enabled]	
Hot Plug	[Disabled]	
Serial ATA Port 1	Empty	
Software Preserve	Unknown	
Port 1	[Enabled]	
Hot Plug	[Disabled]	
Serial ATA Port 2	Empty	
Software Preserve	Unknown	←→: Select Screen
Port 2	[Enabled]	↑↓: Select Item
Hot Plug	[Disabled]	Enter: Select
Serial ATA Port 3	Empty	+/-: Change Opt.
Software Preserve	Unknown	F1: General Help
Port 3	[Enabled]	F2: Previous Values
Hot Plug	[Disabled]	F3: Optimized Defaults
M.2	Empty	F4: Save & Exit
Software Preserve	Unknown	ESC: Exit
M.2 Port	[Enabled]	

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SATA Controller(s)

Enables or disables SATA device.

SATA Mode Selection

Configures the SATA controller as AHCI or RAID mode.

Port 1 to Port 3

Enables or disables SATA port 1, port 2, port 3.

Hot Plug

Enables or disables hot plugging feature on SATA port 1, port 2, port 3,

Boot

This section is used to configure the boot features.



Setup Prompt Timeout

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

Bootup NumLock State

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

Quiet Boot

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

Boot Option Priorities

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

Security

Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.					
Main	Advanced	Chipset	Boot	Security	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> <table> <tr> <td>Minimum length</td> <td>3</td> </tr> <tr> <td>Maximum length</td> <td>20</td> </tr> </table> <p>Administrator Password User Password</p>		Minimum length	3	Maximum length	20
Minimum length	3				
Maximum length	20				
<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>					
Version 2.20.1275. Copyright (C) 2020 American Megatrends, Inc.					

Administrator Password

Select this to reconfigure the administrator's password.

User Password

Select this to reconfigure the user's password.

Save & Exit

Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.					
Main	Advanced	Chipset	Boot	Security	Save & Exit
<p>Save Options</p> <p>Save Changes and Exit Discard Changes and Exit</p> <p>Save Changes and Reset Discard Changes and Reset</p> <p>Save Changes Discard Changes</p> <p>Default Options</p> <p>Restore Defaults Save as User Defaults Restore User Defaults</p> <p>Boot Override</p> <p>UEFI: Built-in EFI Shell</p>					
<p>Exit system setup after saving the changes.</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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Save Changes and Exit

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

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.

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 and reboot the system without saving the changes, select this field then press <Enter>. You may be prompted to confirm again before exiting.

Save Changes

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

Discard Changes

To discard the changes, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes to discard all changes made and restore the previously saved settings.

Restore Defaults

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

Save as User Defaults

To use the current configurations as user default settings for the BIOS, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes.

Restore User Defaults

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

Boot Override

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

Warning Information



Warning:

Because BIOS flashing is potentially risky, we do NOT recommend to change any version of BIOS if current version of BIOS is fine.