HORUS422A

Embedded Server

User's Manual

Revision Date: Dec.12.2022

Safety Information

Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Make sure that your power supply is set to the correct voltage in your area.
- If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your local distributor.

Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter any technical problems with the product, contact your local distributor

Statement

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- All product specifications are subject to change without prior notice

Specifications

System	
CPU	Intel® Core i7-6700TE Processor
Memory type	4 x DDR4 XR-DIMM up to 64GB
Expansion slot	4 x mPCIe slot (two supported with mSATA) 1 x PCIe x4 slot
RAID Function	RocketRAID 840C RAID Card, support RAID 0,1,5,6,10,50,JBOD
Storage Device	12 x 2.5" SAS HDD/SSD Tray (Height up to 15mm)
Front I/O	
USB	2 x USB 2.0
2.5" SSD/HDD Tray	12 (Height up to 15mm)
Power button	1 x Push Button ON/OFF switch with LED indicator
Indicator LED	1 x HDD LED
Rear I/O	
USB	4 x USB 3.0
Gigabit Ethernet	4 x RJ45
FAN	2 x Exhaust FAN
Display	1 x DisplayPort 1 x HDMI
AC inlet	1 x IEC C14 Plug
Mechanical and Environment	
Power Requirement	AC to DC 100 -240V 400W FLEX ATX Switch Power Supply with internal fan
Weight	13.12kg(28.92lbs)
Dimension	430 x 88 x 396mm
Operating Temperature	5 to 50°C
Storage Temperature	-20 to 70°C
Relative Humidity	5% to 95%, non-condensing

Revision History

Revision	Date (yyyy/mm/dd)	Changes
V0.1	2019/03/27	Initial Release
V0.2	2022/12/12	Update CMOS data and ID picture

Packing list

- ☐ HORUS422A Rugged System
- ☐ CD (Driver + Quick Installation Guide)
- ☐ Screw for fixing Bracket Ear

If any of the above items is damaged or missing, please contact your local distributor.

Ordering information

Model Number	Description
HORUS422A	Intel Q170 Sky-lake Rugged Server, 12x 2.5" easy swap Trays ,220V AC-IN, Operating Temperature 5~+50°C

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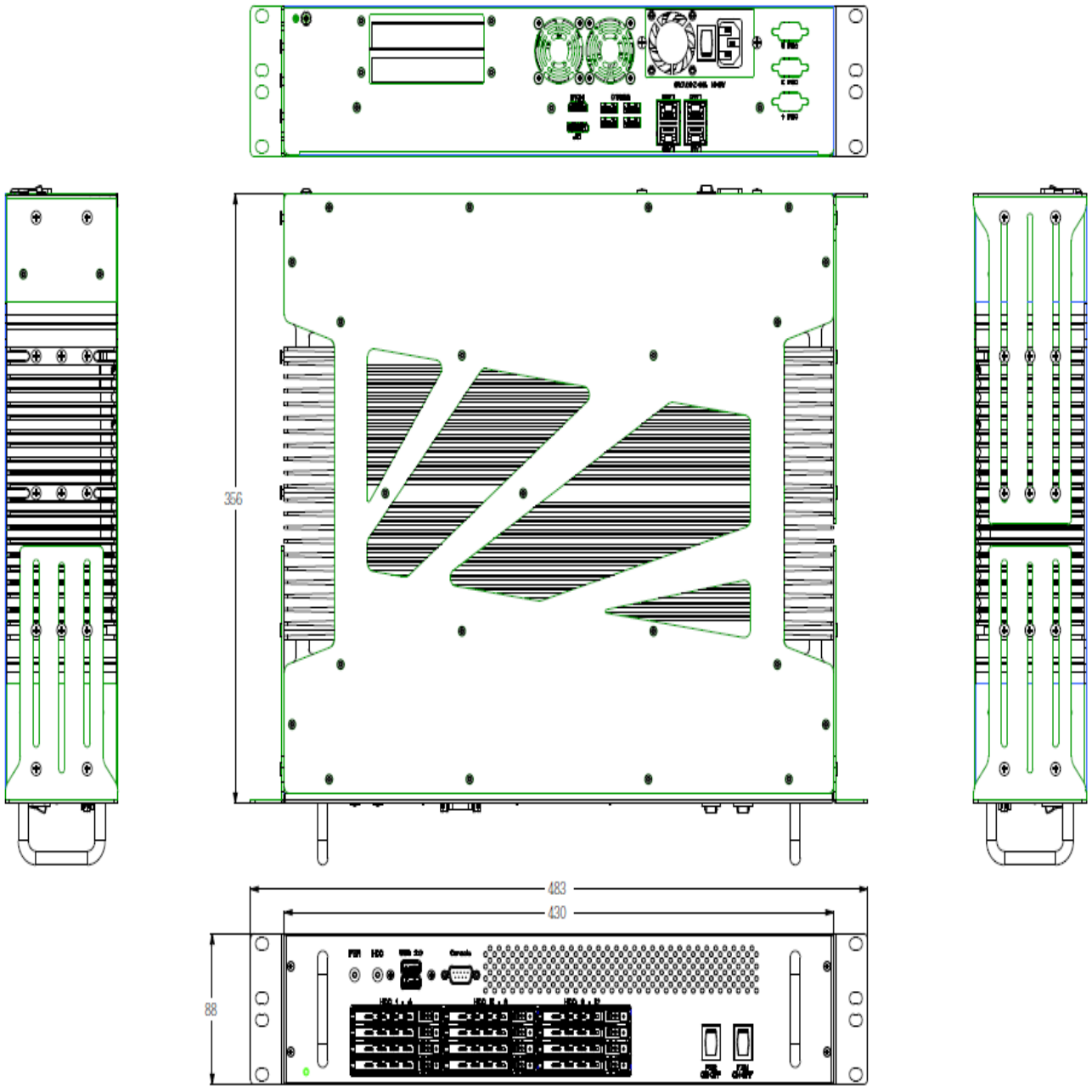
Chapter 1: Product Introduction

1.1 Key Features

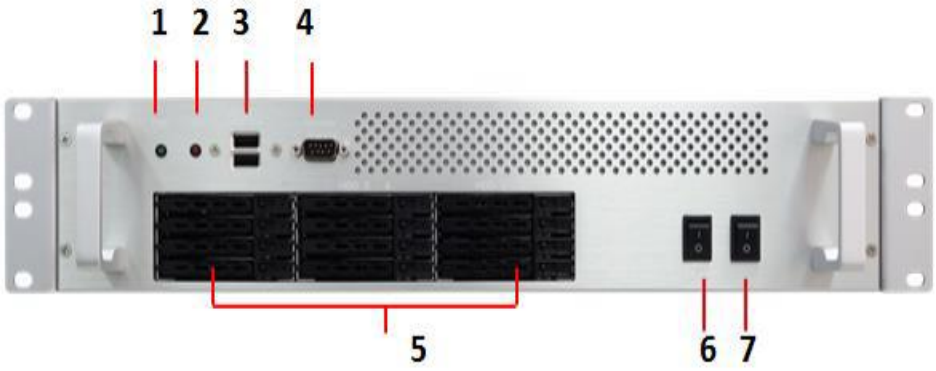
System	
CPU	Intel® 14 nm Skylake-S Intel® Core™ i7-6700TE Processor (8M Cache, 2.40/3.40 GHz)
Chipset	Intel® Q170
Memory Type	4 x XR-DIMM DDR4 up to 64GB
BIOS	AMI® BIOS
Expansion Slot	1 x PCIe x4 single slot
	4 x mPCIe, 2 with mSATA support
Storage Device	2 x mSATA (mPCIe3, mPCIe4)
	RocketRAID 840C RAID Card
	12 x 7mm SATA III 2.5" SSD/HDD
Front I/O	
Power Switch	1
System FAN Switch	1
HDD LED/Power LED	1
Console	1
USB 2.0	2
2.5" Disk Tray	12 x 2.5" (7mm) Easy swap HDD/SSD Trays
Handle	2
Rear I/O	
PSU Switch	1 Notice: Please turn this switch on before turn system on
Exhaust FAN	2 Notice: Smart FANs running when ambient temperature is over 50°C.
USB	4 x USB3.0
Ethernet	4 x RJ45 GbE LAN
DisplayPort	1
HDMI	1
Ground Screw	1
Power Input	1 x AC Inlet, 100-240 VAC
Mechanical & Environment	
Construction	Aluminum chassis with fanless design
Power Requirements	100-240 VAC
Dimension (W x H x D)	430 x 88 x 396mm (16.93" x 3.46" x 15.59")
Operating Temp.	5 to 50°C (ambient with air flow)
Storage Temp.	-20 to 70°C
Relative Humidity	5% to 95%, non-condensing

2 * Specifications are subject to change without notice*

1.2 Dimensions

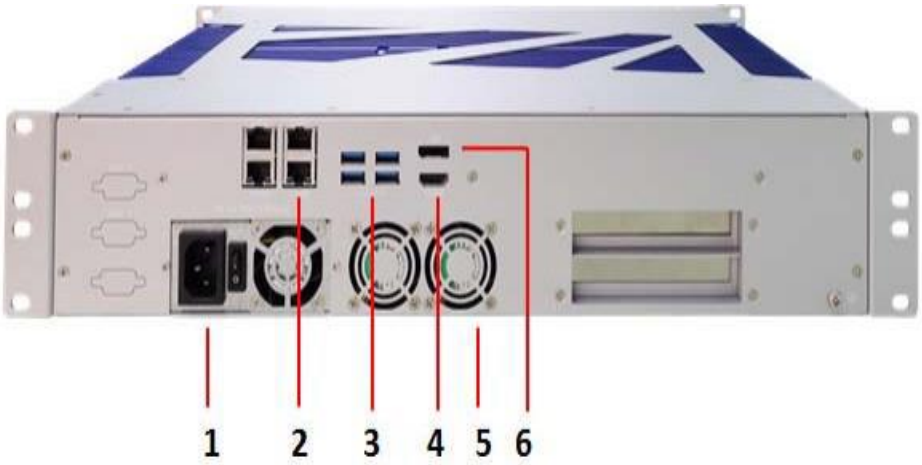


1.3 Front Panel Component



1	Power LED
2	HDD LED
3	2 x USB2.0
4	1 x Console Port
5	12 x 2.5" (7mm) Easy swap HDD/SSD Trays
6	Power On/Off Switch
7	System FAN On/Off Switch

1.4 Rear Panel Component



1	AC-IN
2	4 x RJ45 GbE LAN
3	4 x USB3.0
4	HDMI
5	2 x System FAN
6	DispalyPort

Chapter 2: Jumpers and Connectors

2.1 Connector & LED Pin Definitions

LAN : LAN1- LAN4 and LAN LED

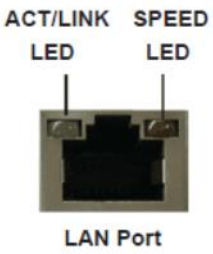
LAN Port LED Indications

Activity/Link LED

Status	Description
Off	No Link
Blinking	Data Activity
On	Link

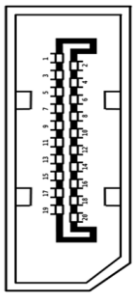
SPEED LED

Status	Description
Off	10Mbps connection
Yellow	100Mbps connection
Green	1Gbps connection



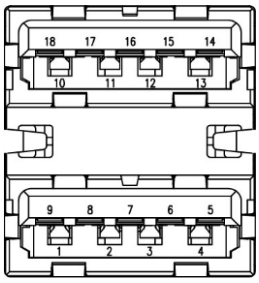
DP : DISPLAY PORT

PIN	DEFINITION	PIN	DEFINITION
1	DPC_LANEP0	2	GND
3	DPC_LANEN0	4	DPC_LANEP1
5	GND	6	DPC_LANEN1
7	DPC_LANEP2	8	GND
9	DPC_LANEN2	10	DPC_LANEP3
11	GND	12	DPC_LANEN3
13	DDIC_DDC_AUX_SEL	14	GND
15	DPC_AUXP	16	GND
17	DPC_AUXN	18	DPC_DET
19	GND	20	DPC_PWR



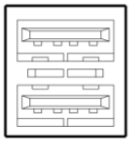
USB3.0 : 1-4

LOWER USB		UPPER USB	
PIN	DEFINITION	PIN	DEFINITION
1	USB_VCC2	10	USB_VCC3
2	USBD0-	11	USBD1-
3	USBD0+	12	USBD1+
4	GND	13	GND
5	USB_SSRX3N_C	14	USB_SSRX4N_C
6	USB_SSRX3P_C	15	USB_SSRX4P_C
7	GND	16	GND
8	USB3TN3	17	USB3TN4
9	USB3TP3	18	USB3TP4



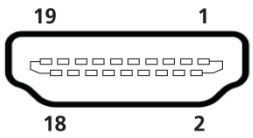
USB 2.0 : 1-2

Pin	Definition	Pin	Definition
1	+5V	5	+5V
2	USBD-	6	USBD-
3	USBD+	7	USBD+
4	GND	8	GND



HDMI:

PIN	DEFINITION	PIN	DEFINITION
1	HDMI_2P	11	GND
2	GND	12	HDMI_CLKN
3	HDMI_2N	13	NC
4	HDMI_1P	14	NC
5	GND	15	DDC CLOCK
6	HDMI_1N	16	DDC DATA
7	HDMI_0P	17	GND
8	GND	18	+5V
9	HDMI_0N	19	HOTPLUG_DETECT
10	HDMI_CLKP		



Chapter 3: AMI BIOS UTILITY

This chapter provides users with detailed descriptions on how to set up a basic system configuration through the AMI BIOS setup utility.

3.1 Starting

To enter the setup screens, perform the following steps:

- Turn on the computer and press the <Del> key immediately.
- After the <Del> key is pressed, the main BIOS setup menu displays. Other setup screens can be accessed from the main BIOS setup menu, such as the Chipset and Power menus.

3.2 Navigation Keys

The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process.

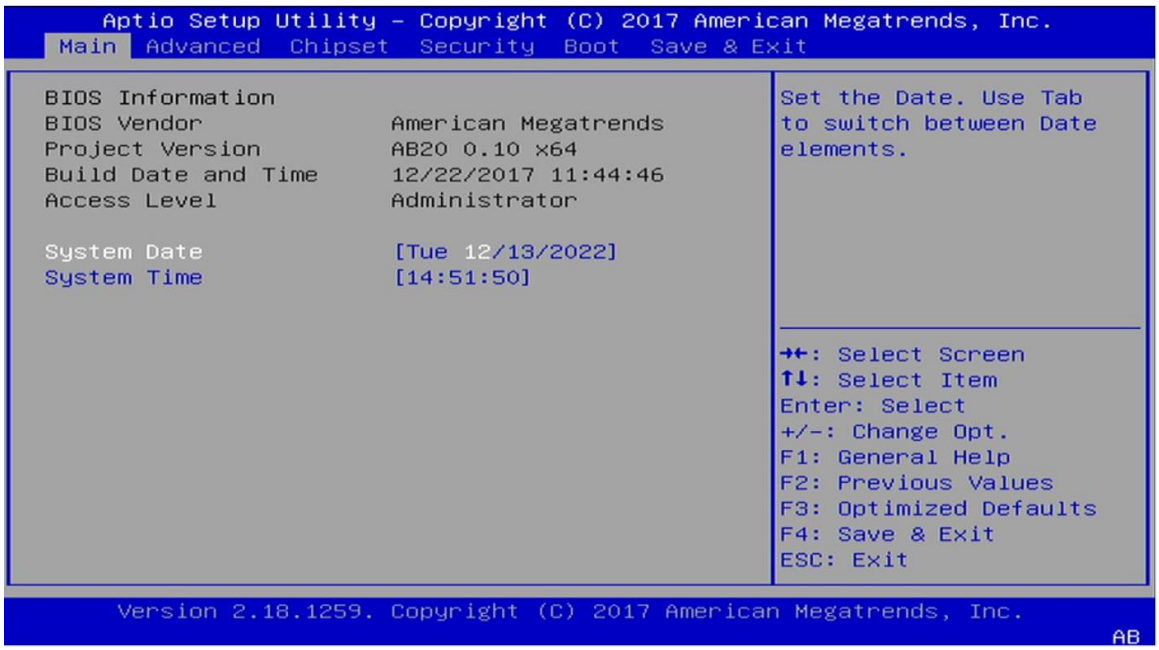
Some of the hot keys are <F1>, <F10>, <Enter>, <ESC>, and <Arrow> keys.

Some of the navigation keys may differ from one screen to another.

Left/Right	The Left and Right <Arrow> keys moves the cursor to select a menu.
Up/Down	The Up and Down <Arrow> keys moves the cursor to select a setup screen or sub-screen.
+– Plus/Minus	The Plus and Minus <Arrow> keys changes the field value of a particular setup setting.
Tab	The <Tab> key selects the setup fields.
F1	The <F1> key displays the General Help screen.
F10	The <F10> key saves any changes made and exits the BIOS setup utility.
Esc	The <Esc> key discards any changes made and exits the BIOS setup utility.
Enter	The <Enter> key displays a sub-screen or changes a selected or highlighted option in each menu.

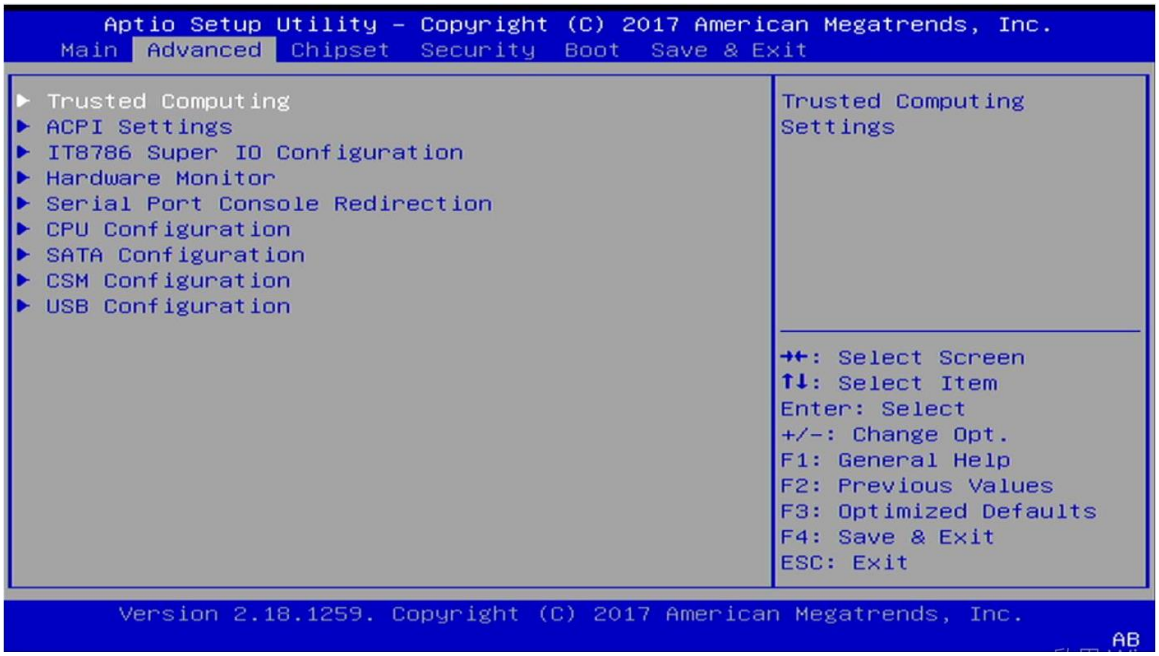
3.3 Main Menu

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

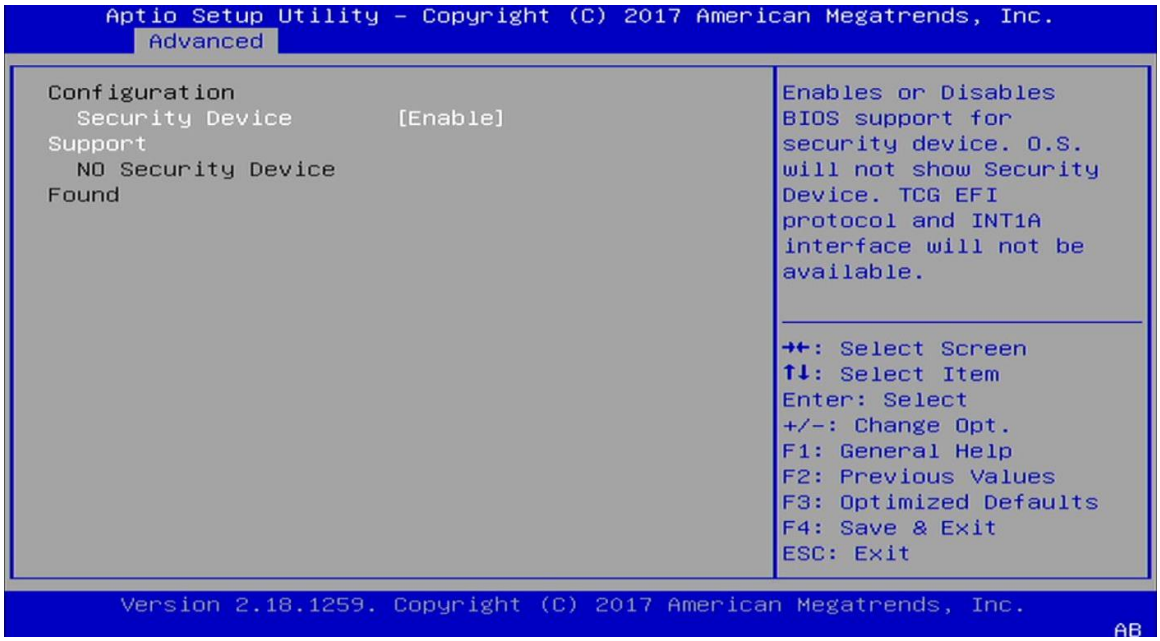


3.4 Advanced Menu

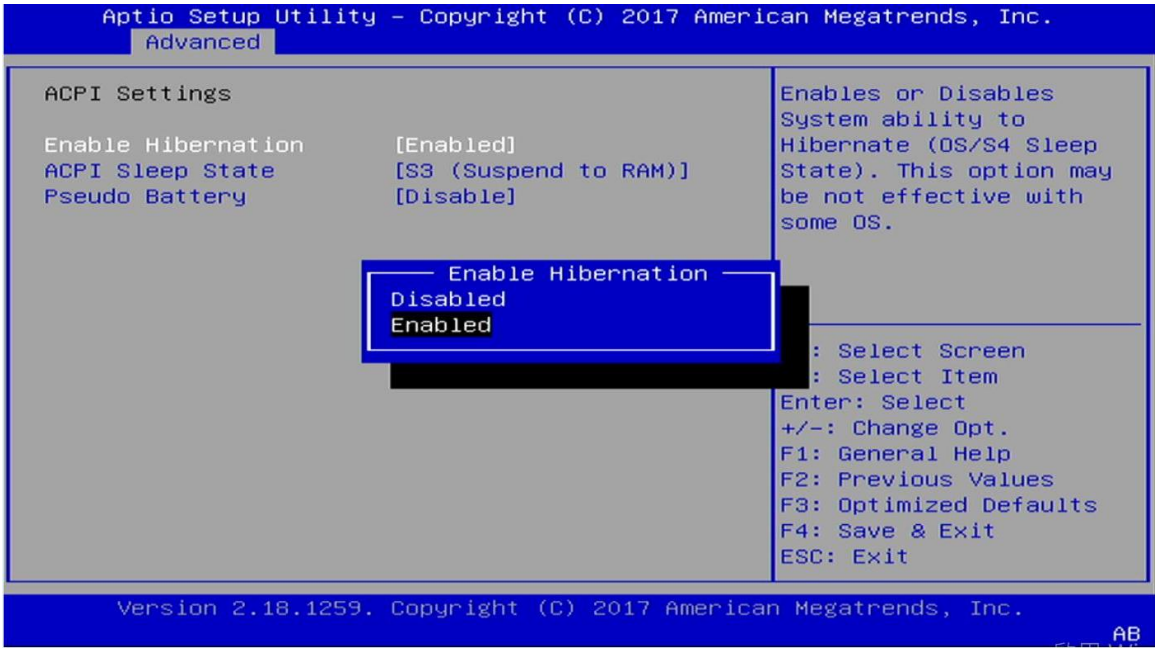
The Advanced Menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference. ***Setting incorrect field values may cause the system to malfunction.***



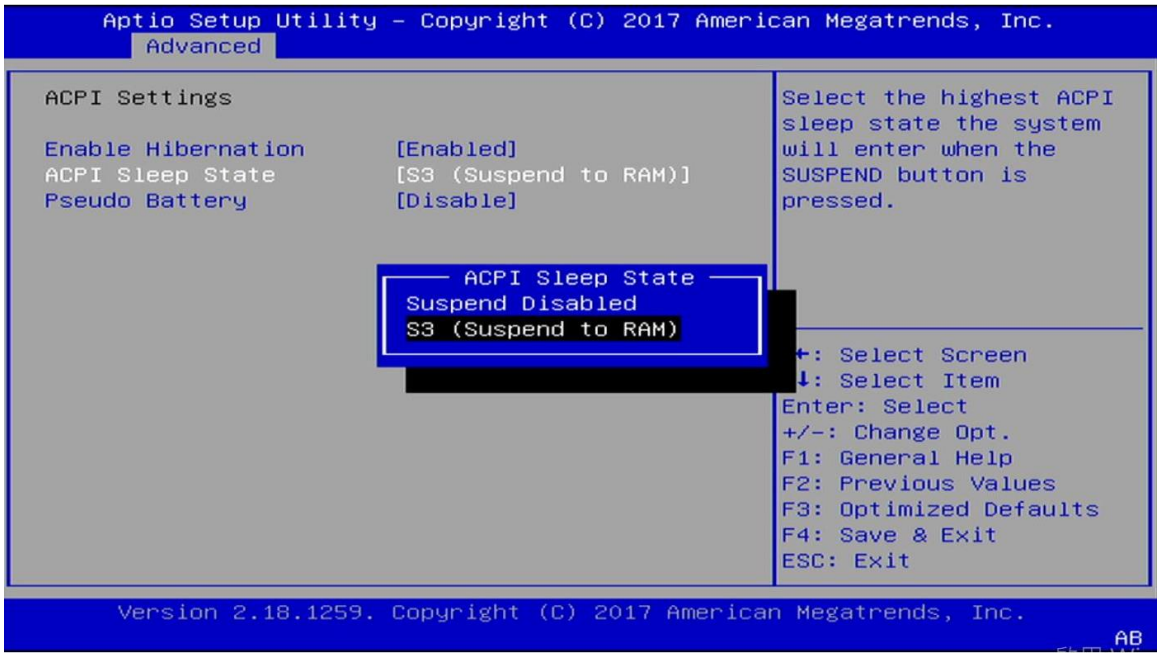
3.4.1 Trust Computing



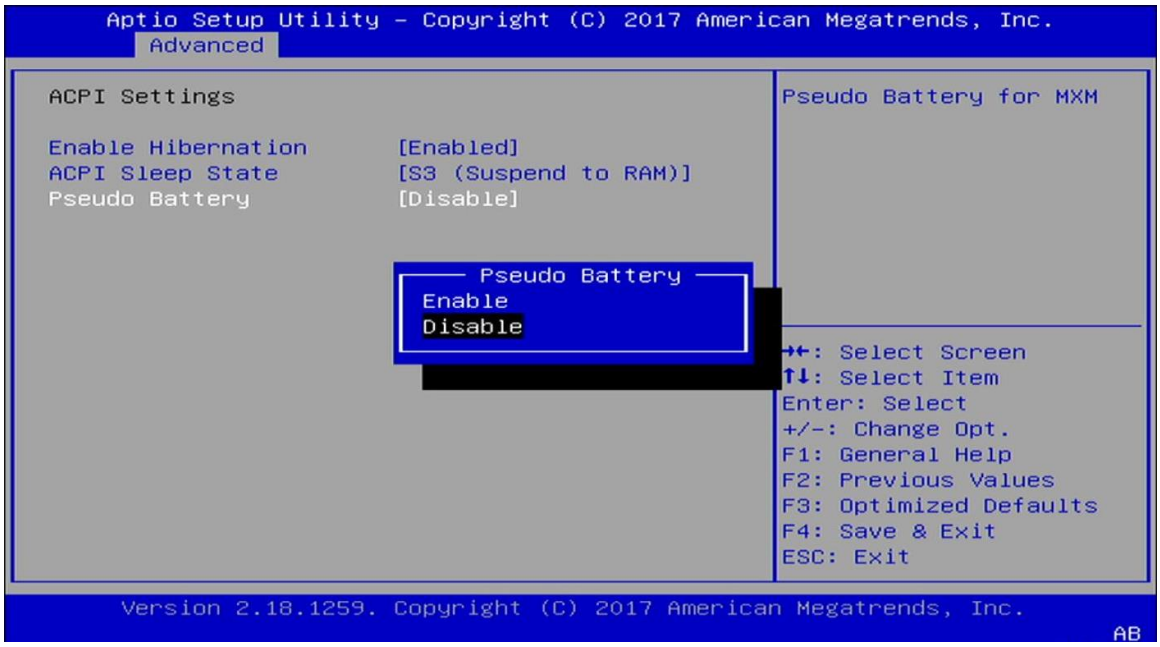
3.4.2 ACPI Setting



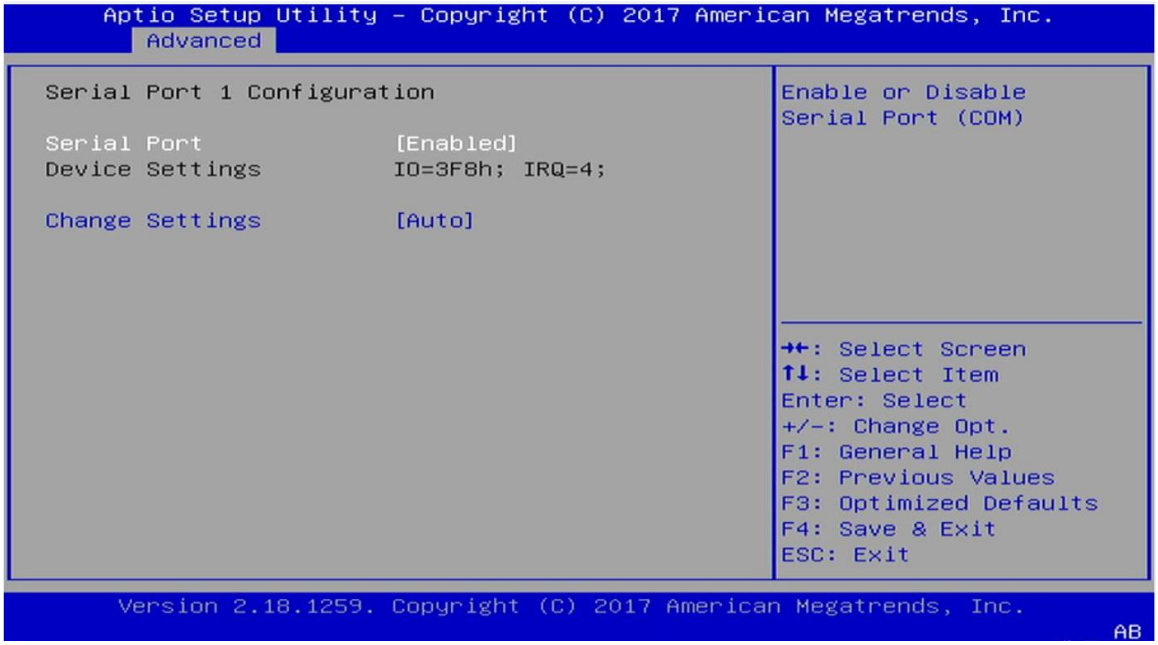
3.4.2.1 ACPI Sleep State



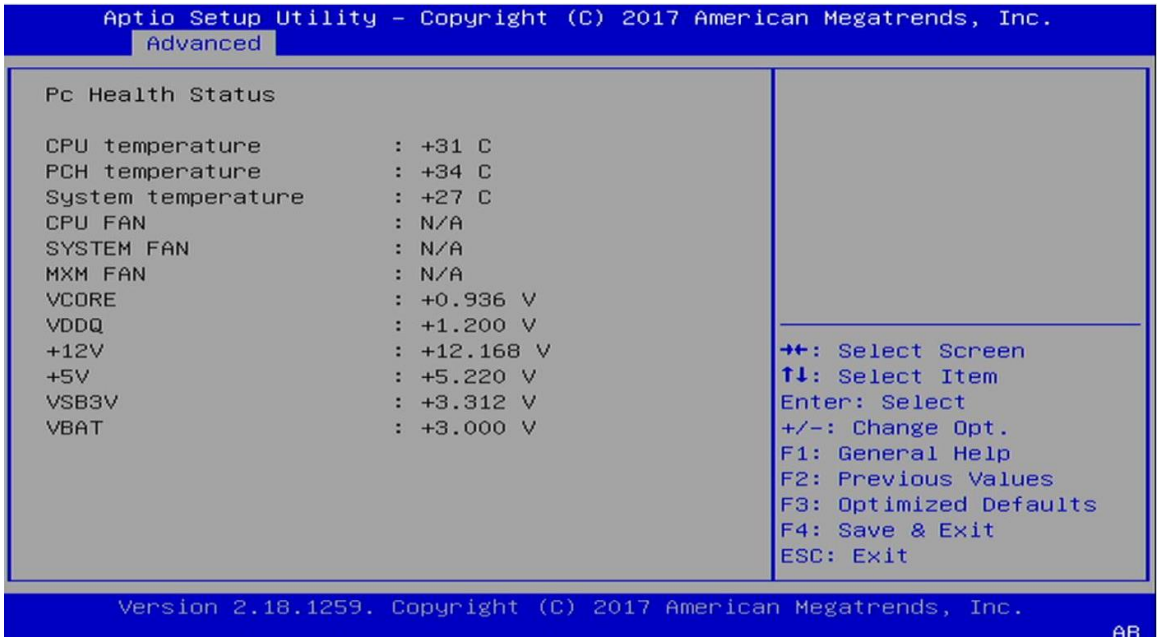
3.4.2.2 Pseudo Battery



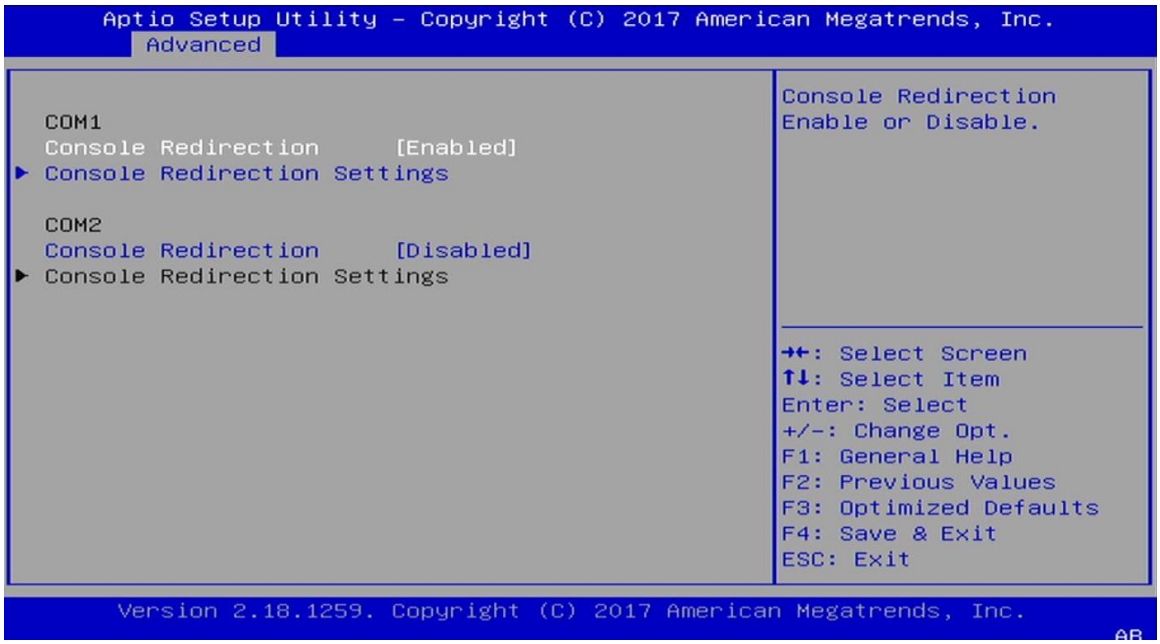
3.4.3 IT8786 Super IO Configuration

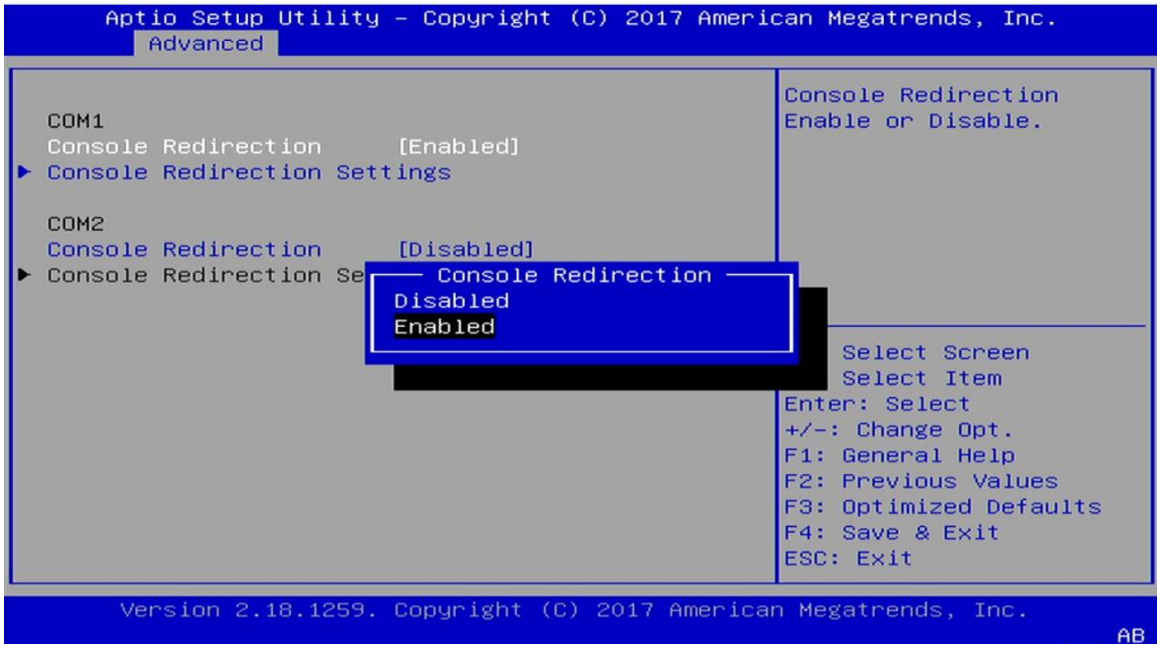


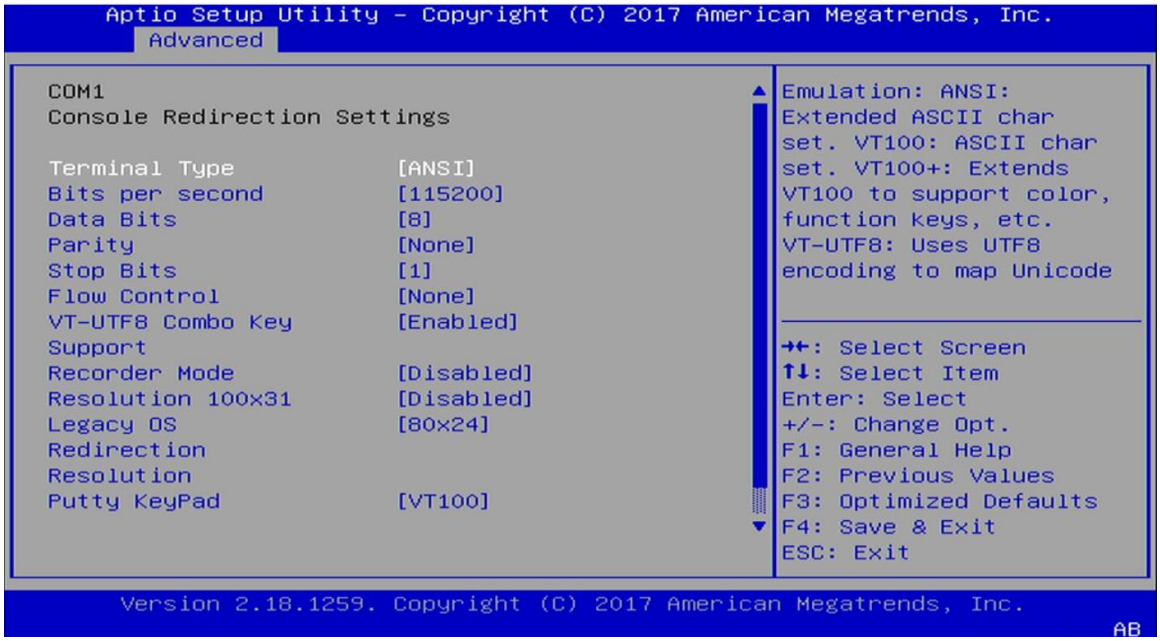
3.4.4 Hardware Monitor



3.4.5 Serial Port Console Redirection




Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
Advanced
COM1
Console Redirection [Enabled]
Console Redirection Settings
COM2
Console Redirection [Disabled]
Console Redirection Se
Console Redirection
Disabled
Enabled
Console Redirection
Enable or Disable.
Select Screen
Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.18.1259. Copyright (C) 2017 American Megatrends, Inc.
AB


Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
Advanced
COM1
Console Redirection Settings
Terminal Type [ANSI]
Bits per second [115200]
Data Bits [8]
Parity [None]
Stop Bits [1]
Flow Control [None]
VT-UTF8 Combo Key Support [Enabled]
Recorder Mode [Disabled]
Resolution 100x31 [Disabled]
Legacy OS Redirection Resolution [80x24]
Putty KeyPad [VT100]
Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.18.1259. Copyright (C) 2017 American Megatrends, Inc.
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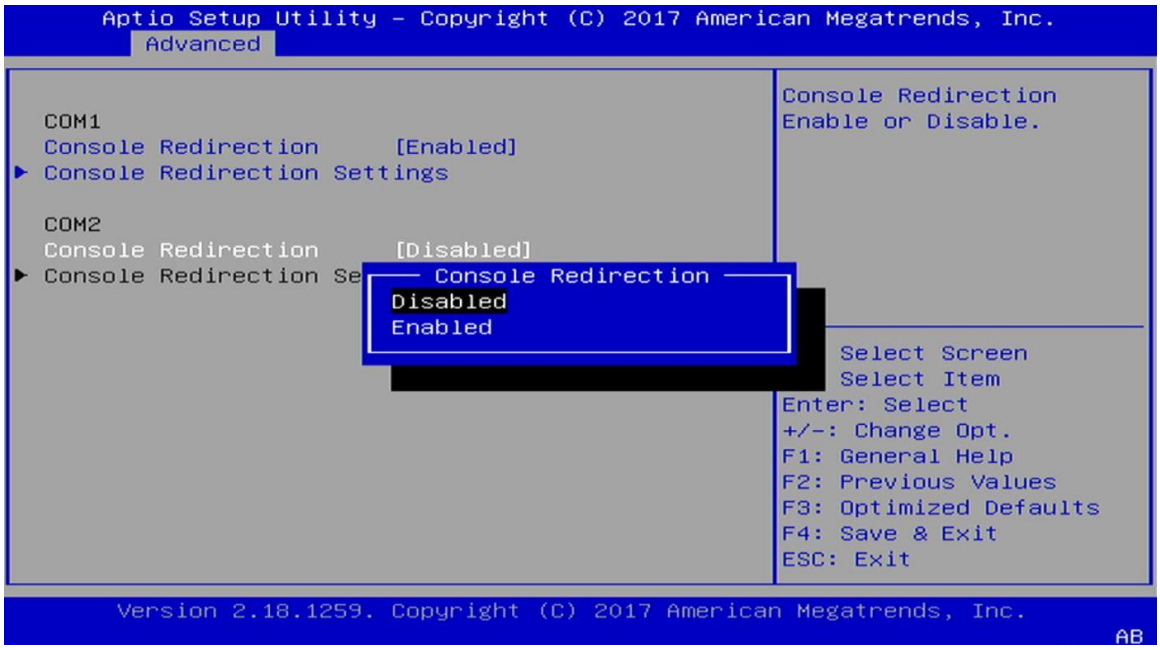
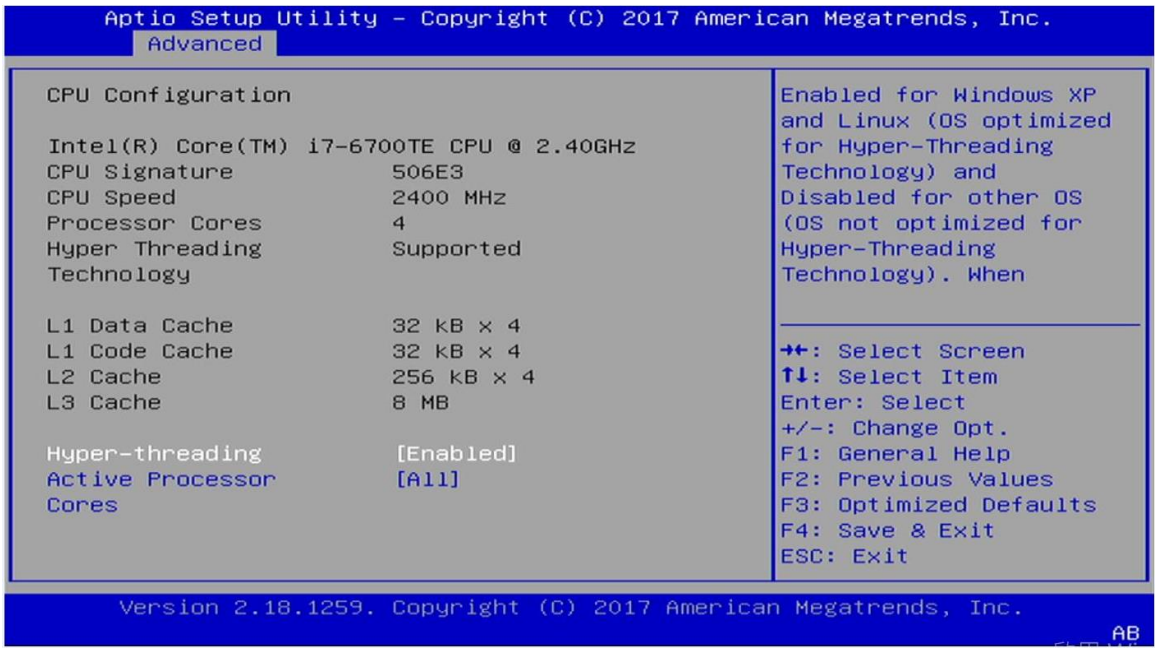
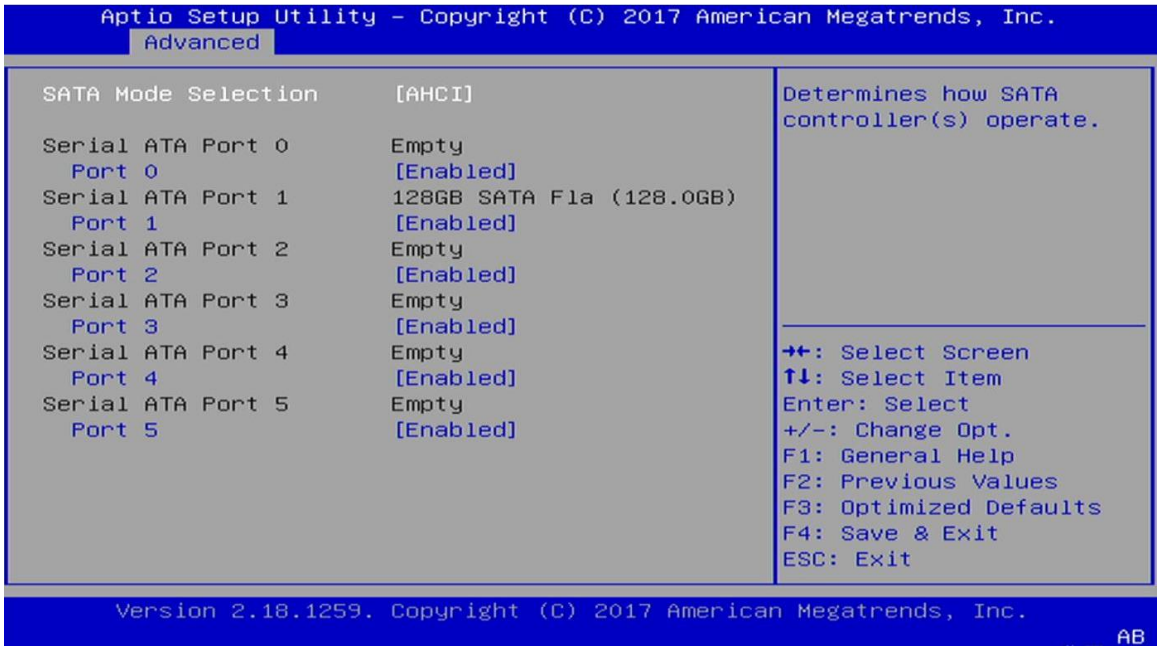


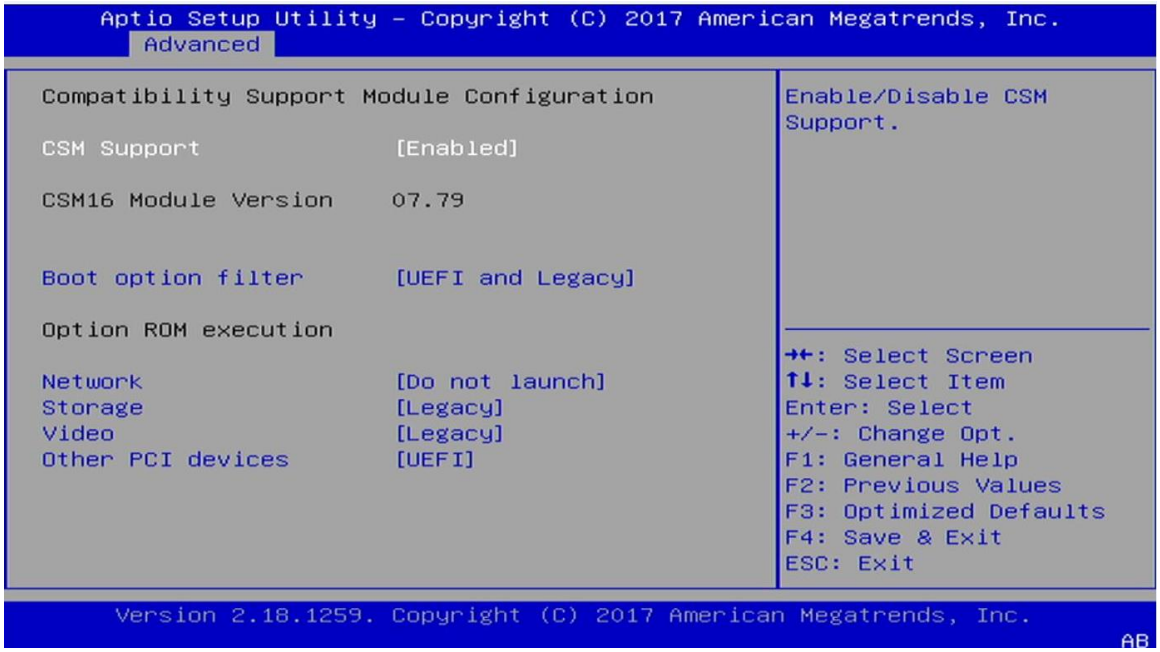
3.4.6 CPU Configuration



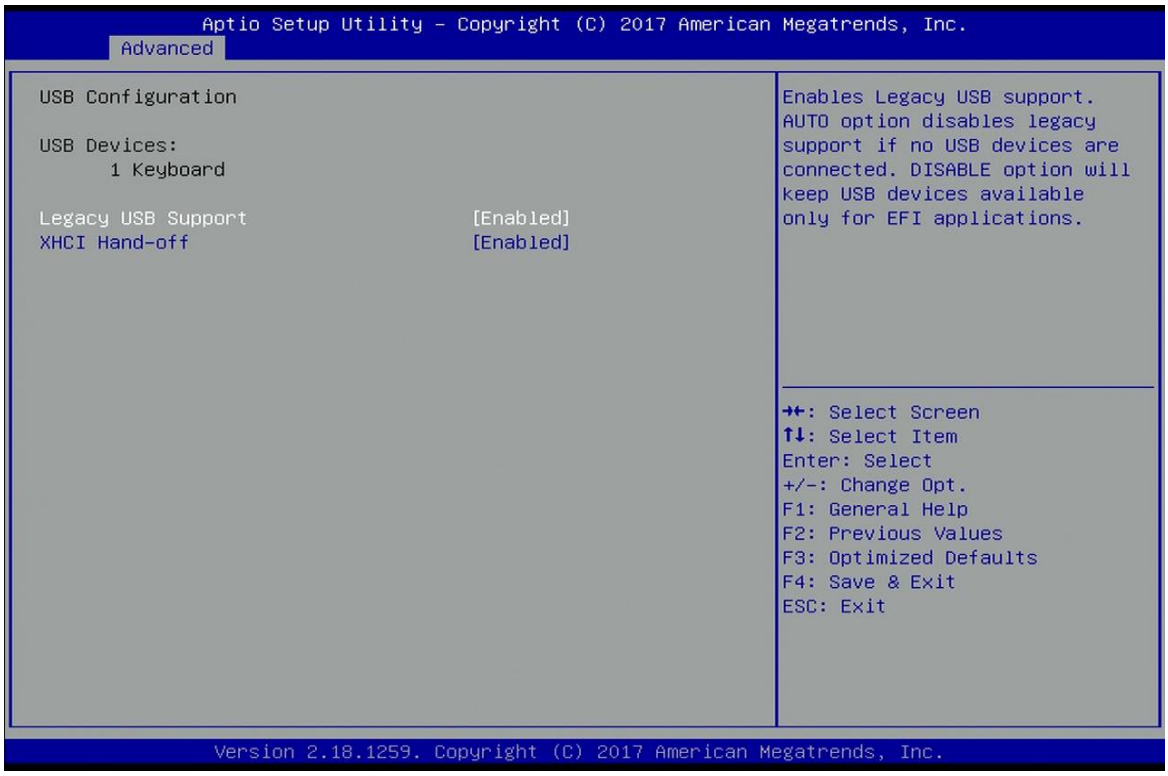
3.4.7 SATA Configuration



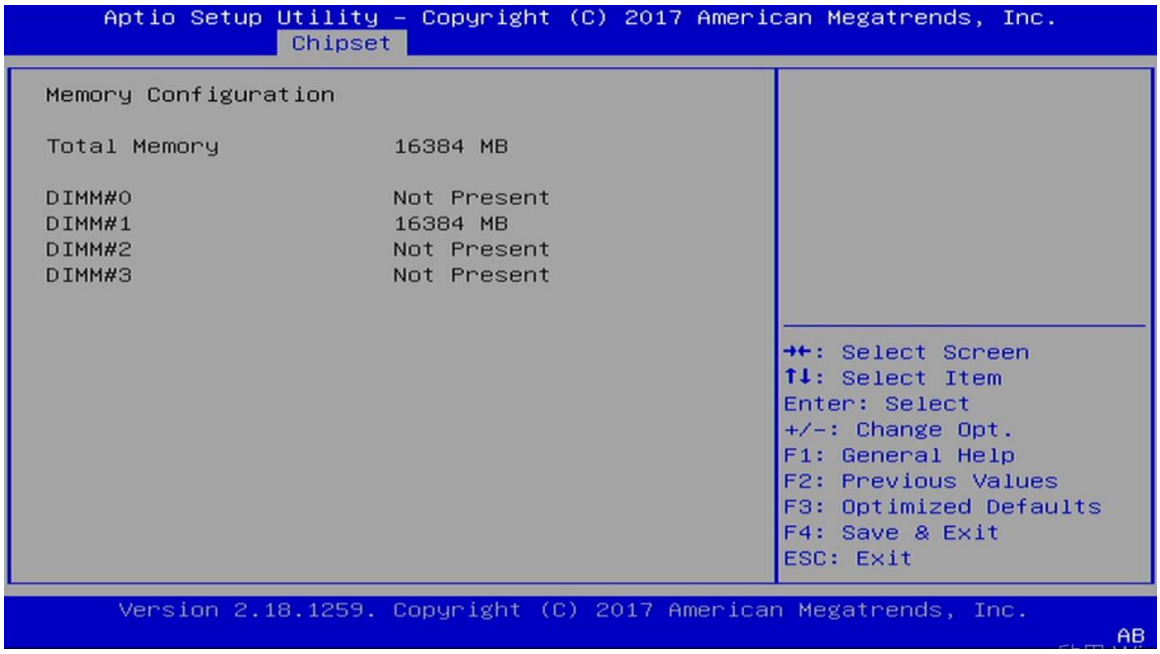
3.4.8 CMS Configuration

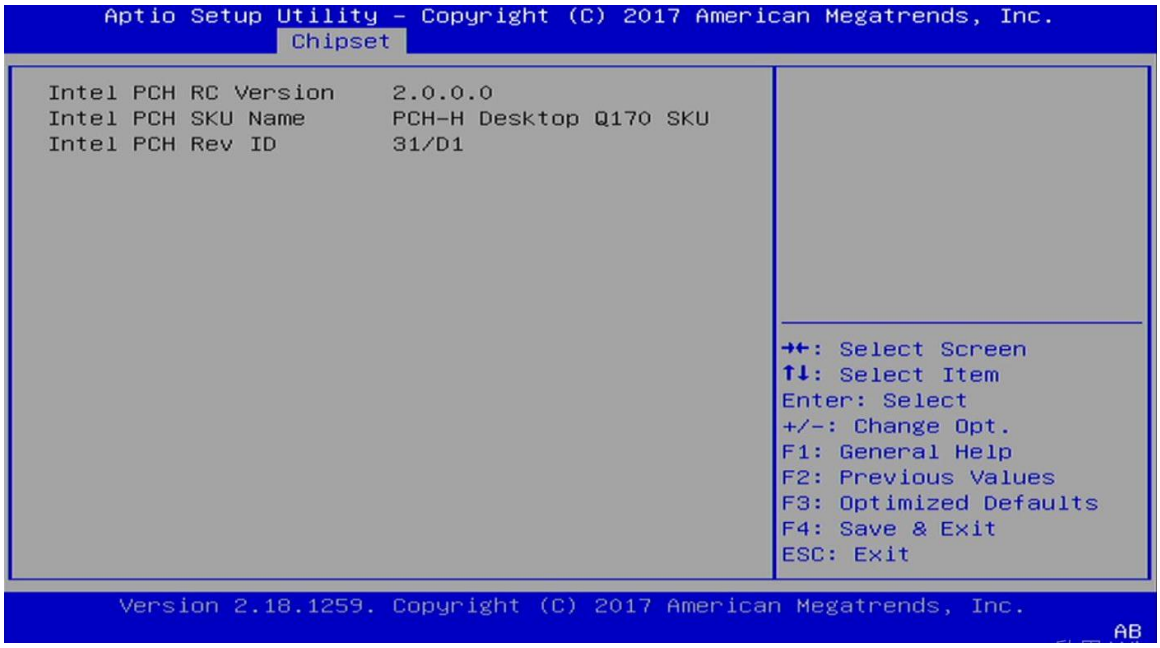


3.4.9 USB Configuration

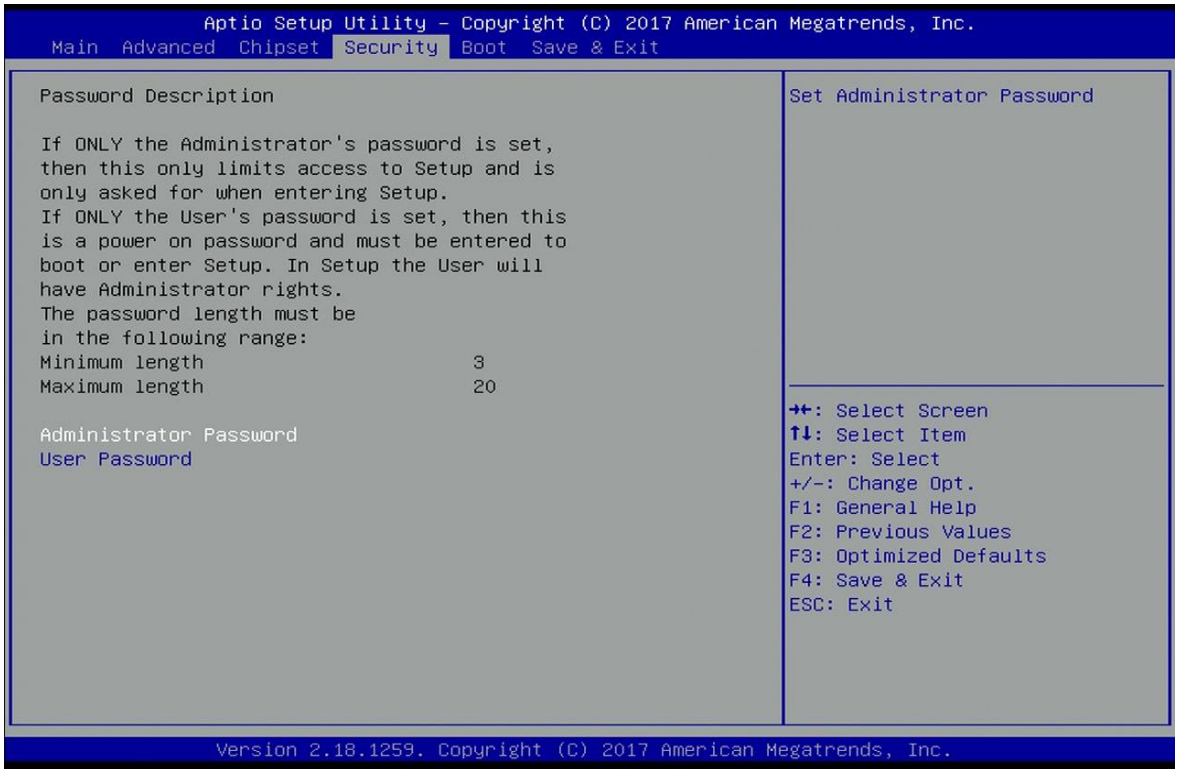


3.5 Chipset




Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
Chipset
Intel PCH RC Version 2.0.0.0
Intel PCH SKU Name PCH-H Desktop Q170 SKU
Intel PCH Rev ID 31/D1
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.18.1259. Copyright (C) 2017 American Megatrends, Inc.
AB

3.6 Security


Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
Main Advanced Chipset Security Boot Save & Exit
Password Description
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:
Minimum length 3
Maximum length 20
Administrator Password
User Password
Set Administrator Password
→←: 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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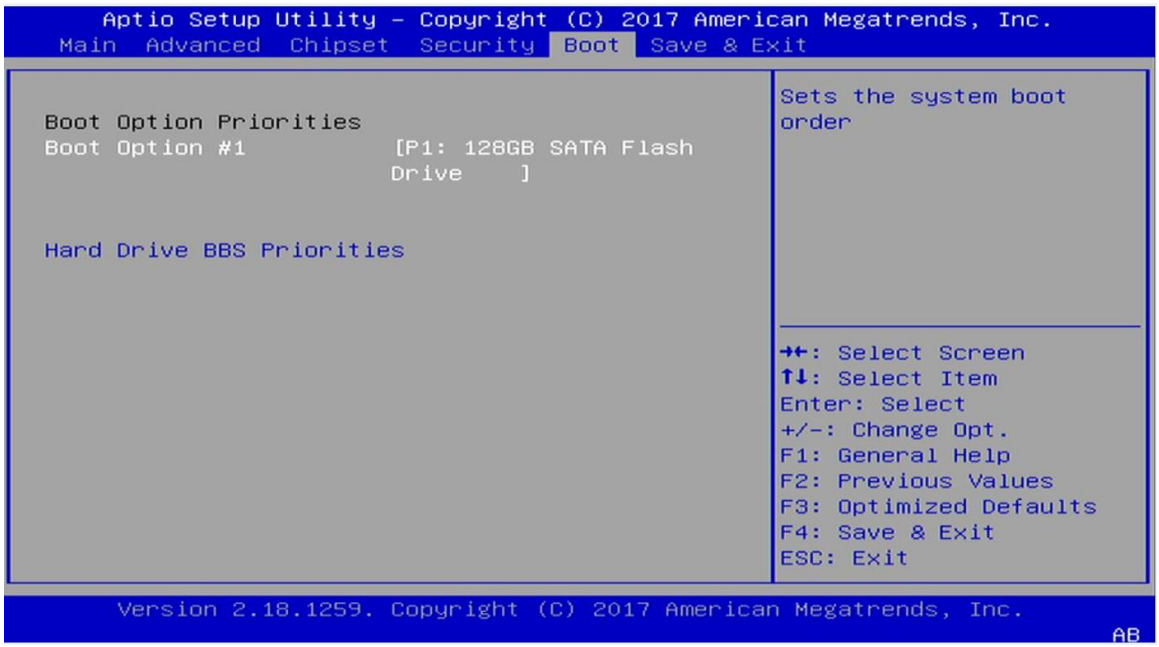
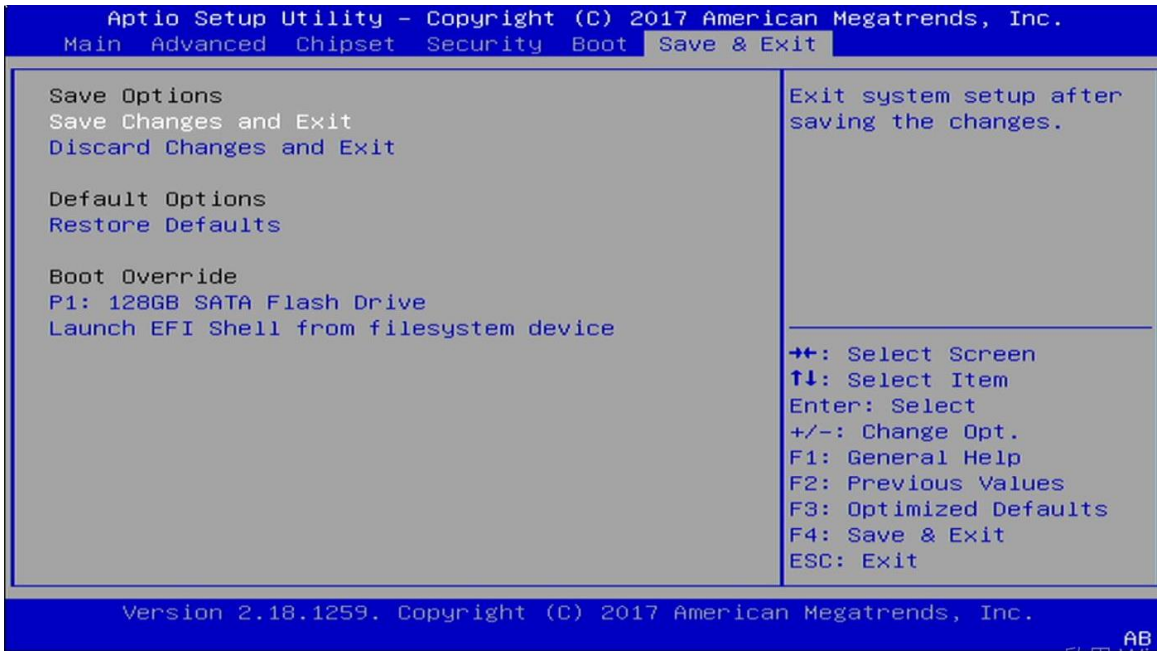
Set administrator password.

User Password
Set user Password.

3.7 Boot Menu

This section is used to configure the boot features.



3.8 Save & Exit