

Introduction

Copyright Statement

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All specifications and applications are subject to change without prior notice

Safety Instruction

1. Please read this safety instruction carefully
2. Please keep this User Manual for future reference
3. Please unplug power line before clearing with wet duster cloth. Do not use liquid or decontamination sprays to clean equipment.
4. Please do not use the equipment in damp environment
5. Please ensure placing equipment on flat surface before installation, accidental drop may cause damage to the equipment.
6. Before connecting the equipment with power supply, please confirm the voltage meets requirement.
7. If you do not use equipment for a long time, please disconnect from power supply to avoid excessive voltage fluctuations
8. Please avoid any liquid in case of fire or short circuit.
9. Please call for professional support with following situations:
 - Damage of power line or plug
 - Liquid inflow into the equipment
 - Exposure to excessive moisture working environment
 - Drop or damage of Equipment
10. Please do not place the equipment in the environment beyond recommended temperature range, or it may cause damage to equipment.
11. The computer is equipped with a real-time clock circuit powered by the battery. If the battery is not replaced correctly, there will be a risk of explosion. Therefore, only the same or the same type of battery recommended by the manufacturer can be replaced. Please follow the manufacturer's instructions to dispose of the used battery.

- Note: any unproven component may cause accidental damage to the equipment. To ensure correct installation, only use the parts provided in the accessory box, such as screws.

Warning and notice

Warning!

During operation, users shall pay special attention to the warning information in this manual to avoid injury.

Notice!

The notes in this manual help users to avoid hardware damage or data loss, such as the risk of exploding if the battery is not replaced correctly. Therefore, you can only replace it with one or the same type of battery recommended by the manufacturer. Please follow the manufacturer's instructions to dispose of old batteries.

Safety Precautions

Follow these simple precautions to protect yourself and your device from harm and damage.

To avoid electric shock, please do not touch the main board and any parts before power off.

Power supply must be disconnected before any parts is replaced, otherwise sensitive components will be damaged due to excessive power when connecting jumpers or installing other components.

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Chapter 1 Overview

1.1 Brief Introduction

E300 Series ultra-compact embedded computer are based on Intel Apollo Lake processor, with optimum I/O design to fulfill multi connection requirements. Reinforced aluminum alloy enclosure design is ideally suitable for steady performance in harsh industrial environment.

E300 Series has unique expansion design to go through PCIe/USB/SPI/I2C/LPC connections to expand and achieve rich and effective customization.

E300 Series intelligent and powerful embedded computer supports wide range of applications and easy arrangement and deployment, it has excellent performance in Intelligent Transportation, Facility Management, Industrial Automation and Internet of Things.

1.2 Specification

P/N	E300 series	E310 series
CPU	Intel Apollo Lake N3350/N4200/J3455/E3900 Series processor	
Memory	Onboard 2GB DDR3L upto 8GB	
Display	1x DP, Max.4096 x 2304 @ 60Hz	
	1x HDMI, Max.4096 x 2304 @ 24Hz	
	HDMI+DP independent display	
Audio	Realtek ALC662, High Definition Audio. Line-out, Mic-in	
Ethernet	1x RTL8111H GbE, support Wake On Lan	1x RTL8111H GbE, support Wake On Lan
		2x Intel i211 GbE, support Wake On Lan
Serial Port	1 x RS232 (optional)	2 x RS232, 2 x RS485
USB	2 x USB3.0, 2 x USB2.0	2 x USB3.0, 3 x USB2.0 (1x USB2.0 internal)
Mini-PCIE	-	1 x Full Size for WLAN/WWAN module
SIM Card	-	1 x USIM for 3G/4G LTE communication
M.2 E Key	1 x M.2 E Key for WLAN	-
eMMC	8GB upto 256GB	
TF-Card	1x TF slot	
SATA3.0	-	1 x SATA3.0 for 2.5" HDD
Power Supply	24W AC-DC power adaptor	12~32V DC-input
OS	Windows 10 64 Bit, Linux	
Enclosure	Aluminum Alloy	
Mounting	Wall Mounting	
Dimension	120 x 101 x 39.5mm (LxWxH)	120 x 101 x 51mm (LxWxH)
Weight	0.57kg	0.65kg
Operation Temperature	-20°C~ 60°C, airflow 0.7m/s	
Storage Temperature	-40°C~80°C	
Relative Humidity	95% @ 40 (Non-Condensing)	
ESD	Contact +/-4 KV, Air+/-8 KV	
EMC	CE/FCC	

Table 1-1: Specification

1.3 Dimension

Dimension for E300 series Fanless Embedded computer, all units are in millimeters (mm).

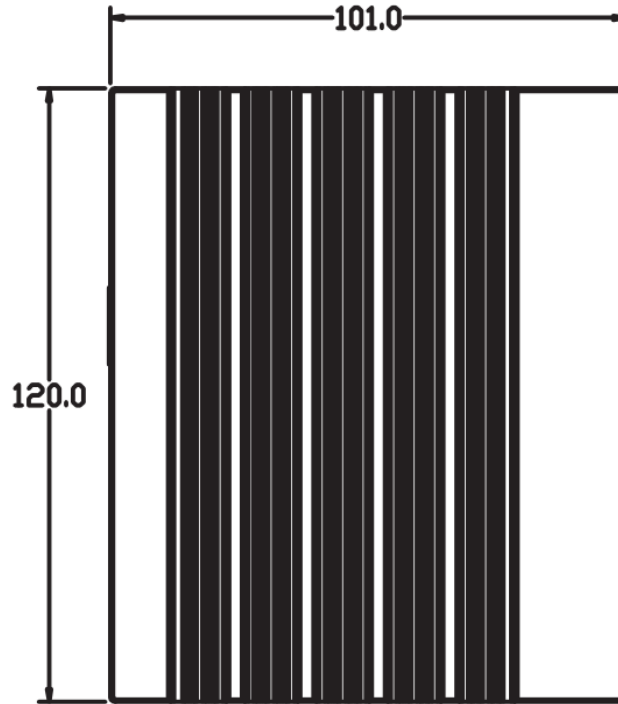


Figure 1-1: Top view

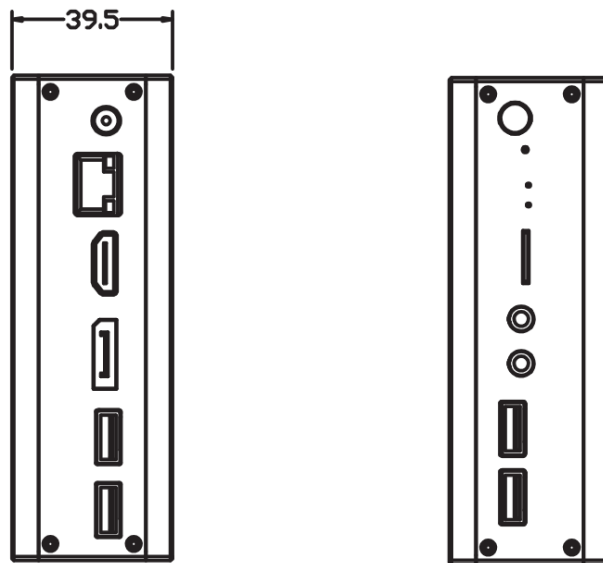


Figure 1-2: Side view

E300 Series Fanless Embedded Computer

Dimension for E310 series Modular Fanless Embedded computer, all units are in millimeters (mm).

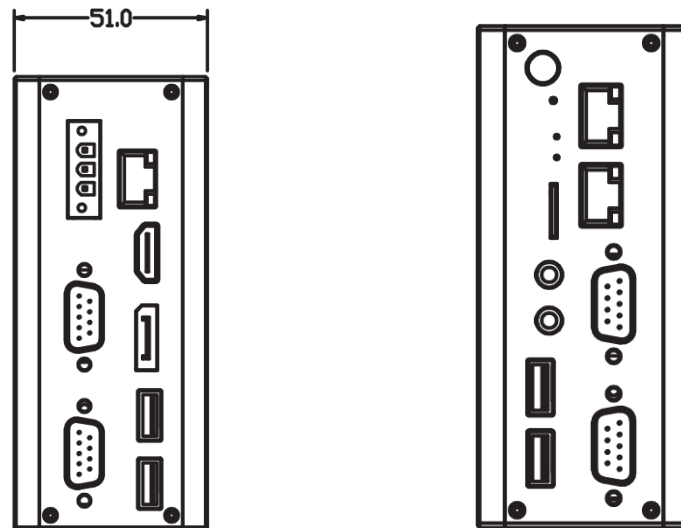


Figure 1-3: Side view

1.4 LED Indicators




Icon	Color	Status	Description
	Blue	Power	Power off: Off Power on: On
	Green	SATA HDD test	With HDD: light on Operating: blink No HDD: light off
	Green	Standby Indicator	Standby: blink Operating: light off

Table 1-2: LED Operation Indicators

Chapter 2 I/O Interface

I/O Instruction

I/O connectors on front, rear and side panel of E300 series. *mark is specific for E310 series.

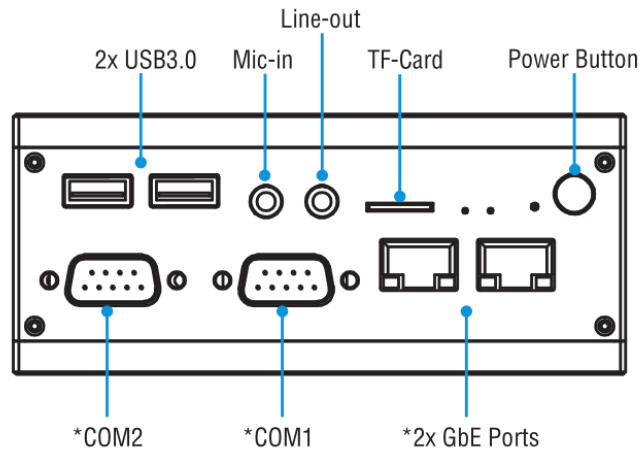


Figure 2-1: Front Panel I/O

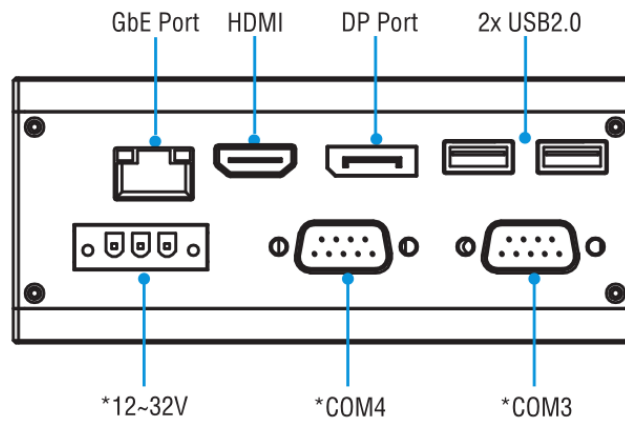


Figure 2-2: Rear Panel I/O

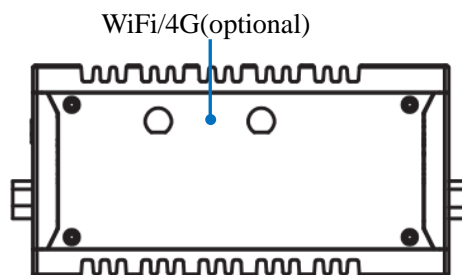


Figure 2-3: Side Panel I/O

2.1 Power Button

The power button is a non-latched push button with a blue LED indicator. System is turned on when button is pressed, and the power LED lit. If the system hangs, depressing the button for 5 seconds powers down the system.



Figure 2-4: Power Button

2.2 Power Input Interface

E300 series DC jack 12V Power input, E310 series 12~32V 3pin phoenix.

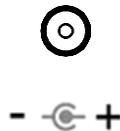


Figure 2-5: 12V DC input jack

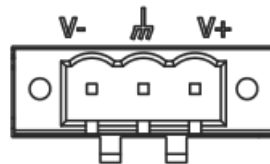


Figure 2-5: Phoenix DC input

2.3 DisplayPort Connector

One DisplayPort connector on the rear panel supports for resolutions Max. 4096 x 2304 @ 60Hz.

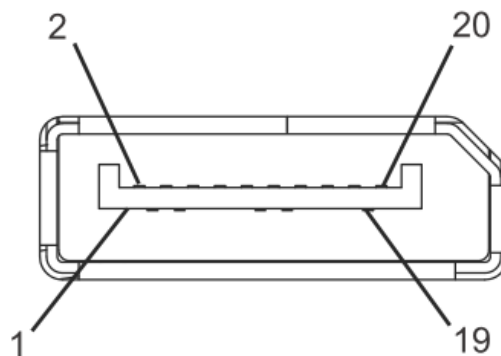


Figure 2-7: DisplayPort Connector

2.4 HDMI Port

One HDMI port on the rear panel supports for resolutions Max. 4096 x 2304 @ 24Hz.

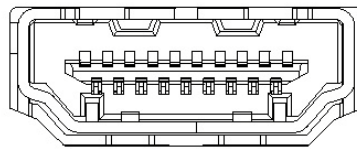


Figure 2-8: HDMI Port

2.5 USB Port

2xUSB2.0, 2xUSB3.0 supporting plug and play which allow users connect or disconnect any time, no need to shut off the computer.

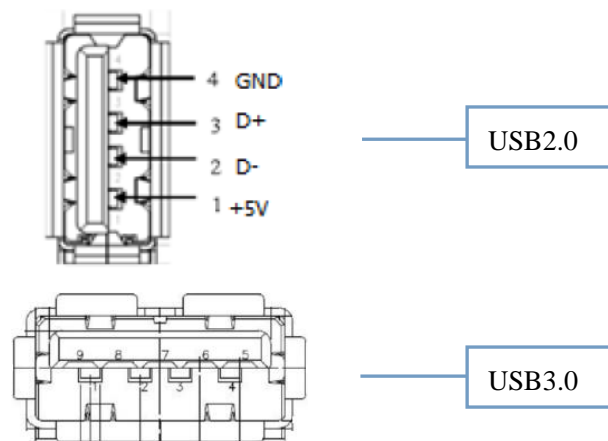


Figure 2-9: USB port

2.6 Ethernet (LAN)

One Ethernet port on the rear panel support with Intel i210 GbE controller for E300.

Three Ethernet ports on front and rear panel with one RTL8111H GbE and two Intel i210 GbE controllers for E310.

RJ-45 standard socket

LED indicator on front panel indicates Transmission/Connected status.

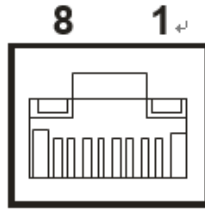


Figure 2-10: Ethernet

2.7 Audio

Two 3.5 stereo Audio ports support Mic-in and Line-out.
 Audio controller Realtek ALC662



Figure 2-11: Mic-in and Line-out

2.8 Serial Port (COM)

Onboard 9-pin RS232 connector for E300

Four D-sub 9-pin Serial Ports supports 2 x RS232 (COM1, COM2) and 2 x RS485 (COM3, COM4) for E310.

Reminder: recognizing with the first pin and noticing the triangle next to the serial socket.

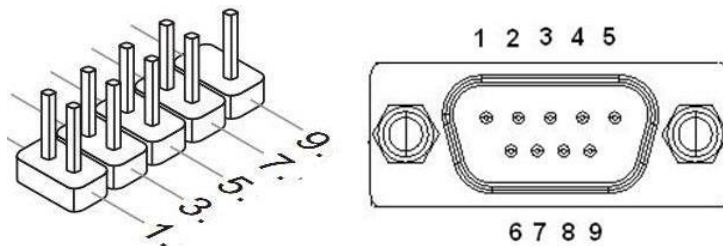


Figure 2-12: Serial Ports

Pin	RS232(D-sub)	RS485(D-sub)	RS232(Onboard)
1	DCD	DATA-	DCD
2	RXD	DATA+	DSR
3	TXD	NC	RXD
4	DTR	NC	RTS
5	GND	GND	TXD
6	DSR	NC	CTS
7	RTS	NC	DTR
8	CTS	NC	RI

9	RI	NC	GND
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Table 2-1: Pin definition of Serial Port

Note: NC stands for No Connection

2.9 TF Card

1 x TF Card slot, Max 256GB



Figure 2-13: TF Card

2.10 Wi-Fi/4G Antenna (optional)

1 x M.2 E Key for WLAN, Wi-Fi communication – E300 series

1 x Full Size Mini-PCIE for WLAN or WWAN module, 1 x USIM for 3G/4G LTE communication – E310 series



Figure 2-14: Wi-Fi/4G Antenna

2.11 Clear CMOS

Clear CMOS Jumper as Figure 2-15.

CMOS is powered by button cell on motherboard. To clear CMOS will result in permanent elimination of system settings and will be restored to factory default settings.

Steps:

- (1) Turn off computer and disconnect power supply
- (2) Press Clear CMOS for 3-5 seconds with a slender needle and release
- (3) Start computer and press Del entering into BIOS setting to reload optimum default value
- (4) Save and exit



Figure 2-15: Clear CMOS



Do not clear CMOS when computer is power on to avoid any damage of the device.

2.12 Build-in 5V/12V Power Interface

Build-in 2-pin 5V/12V power interface, user can supply power to the device according to their needs.

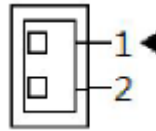


Figure 2-16: 5V/12V Power Interface

Pin	5V	12V
1	5V+	12V+
2	GND	GND

Table 2-2: Pin Definition

2.13 Build-in Remote Switch Interface (CONN_EXT_BTN)

User can choose relevant signal according to their needs with 4-pin build-in remote switch interface on E300 motherboard.



Figure 2-17: Remote Switch Interface

Pin	Remote Switch
1	PWR
2	GND
3	GND
4	3.3V+

Table 2-3: Pin Definition of Remote Switch

Chapter 3 Operating Instruction

3.1 Unpacking check

Before unpacking, check the packing list about part number and details. After unpacking, check the device inside. If there's any damage or inconformity of product details, inform your dealer immediately.



To avoid static electricity from damaging the device, please touch a metal object which effectively grounded before touching the device circuit to release the static charge carried by body and please wear anti-static gloves.

3.2 Operation Environment

Keep device away from high-power and strong electromagnetic commercial appliances and environment.

3.3 Getting Started

Be prepared with following before installation:

- (1) E300 Unit
- (2) DisplayPort/HDMI display
- (3) Cables
- (4) Keyboard and mouse

3.4 Installation

3.4.1 Step1: hardware connection

- (1) Get computer and display ready
- (2) Connect computer to network interface with cables
- (3) Connect computer to display with DP/HDMI
- (4) Start up

E300 Series Fanless Embedded Computer



Figure 3-1: E310 connections

3.4.2 Step 2: Software installation

- (1) Install operation system
- (2) Install relevant drivers

Chapter 4 BIOS Setup Instruction

4.1 BIOS Introduction

BIOS is a basic input/output control program stored in Flash Memory. The program is a bridge between the motherboard and the operating system and is responsible for managing the parameter Settings between the motherboard and the expansion card. When the computer is activated, it is controlled by a BIOS program, which first performs a self-test called POST and detects all hardware devices and confirms synchronization hardware parameters. It does not transfer control of the system to the operating system (OS) until all checks are completed.

Because BIOS is the only channel that hardware and software contact, how to properly set the BIOS parameters will determine whether your computer is running stable and whether it's in the best state, so correct BIOS setting is the key factor of system stability, and to ensure the system performance to achieve the best state.

CMOS Setup will store the set data in the built-in CMOS SRAM on the main board. When power is turned off, the lithium battery on the motherboard continues to power the CMOS SRAM. The BIOS Settings utility allows you to configure:

- 1) Hard drives and peripherals
- 2) Video display type and options
- 3) Password protection
- 4) Power management characteristics



Since BIOS version of the motherboard is constantly being updated, the BIOS description in this manual is for reference only. We do not guarantee that the content of this manual is consistent with the information you have obtained.

4.1.1 CMOS Setup

When the computer is started, BIOS enters the boot self-check (Post) program, which is a series of diagnostic programs fixed in the BIOS. When the self-check program is completed and no error, you can press DEL or ESC to enter the BIOS interface. If this message disappears before you could respond, you can turn it off and restart your computer, or you can restart your computer by simultaneously pressing <Ctrl> +<Alt>+<Delete>.

4.1.2 Function Key and Instruction

↑	Move to previous item
↓	Move to next item
←	Move to left
→	Move to right
ESC	Exit current screen
Enter	Confirm
+	Change settings or increase value
—	Change settings or DEcrease value
F1	Help
F2	Load last value
F3	Load optimum value
F4	Save settings and exit CMOS SETUP

Main screen Instruction

As you move the options on the Setup home screen, the main Settings for the corresponding options are shown below. If you want to leave the help window, just press ESC.

4.2 Main Menu

When you enter the CMOS setup menu, the main menu as shown in Figure 4.1 can be seen on the top of the screen. In the main menu, you can select different setting options and press left and right direction keys to select. After selecting the submenu, detailed setting options will be displayed at the bottom.

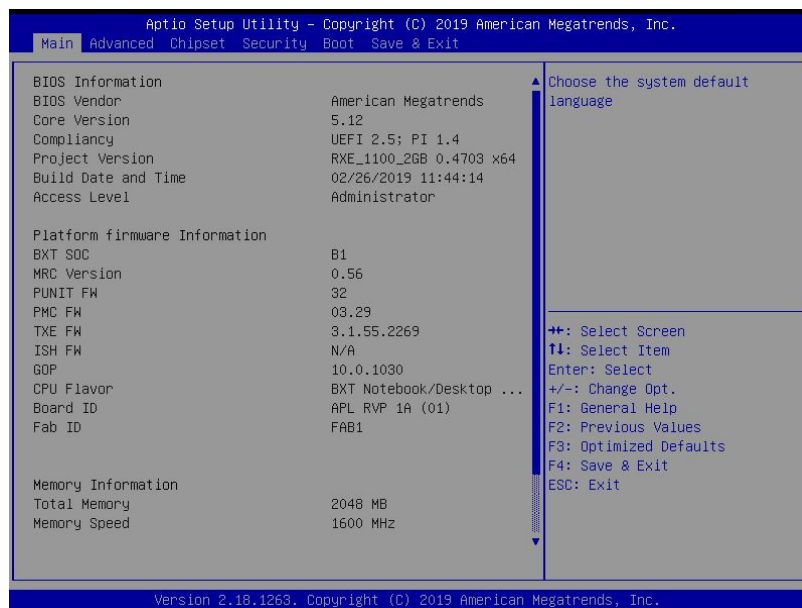


Figure 4-1: Main Menu

- 1) Main (Standard CMOS setting)
 - Set time and date
- 2) Advanced (Advanced BIOS setting)
 - Set CPU, USB, PCI, LAN
- 3) Chipset
 - Set North Bridge, South Bridge
- 4) Security (Administrator/User & P/W)
- 5) Boot (Startup configuration feature)
- 6) Save&Exit

4.3 Main(Standard CMOS setting)

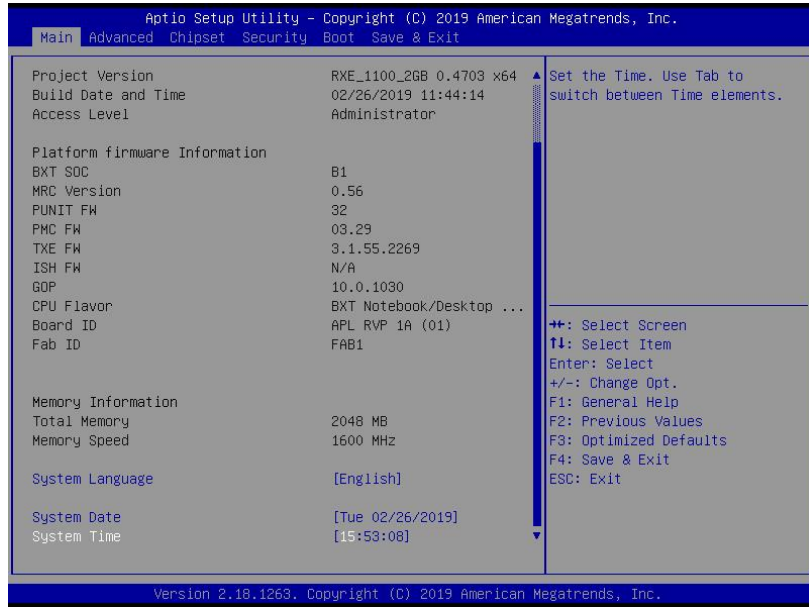


Figure 4-2: Main Menu

- 1) System Time(hh:mm:ss)
- 2) System Date(mm:dd:yy)

4.4 Advanced(Advanced BIOS settings)

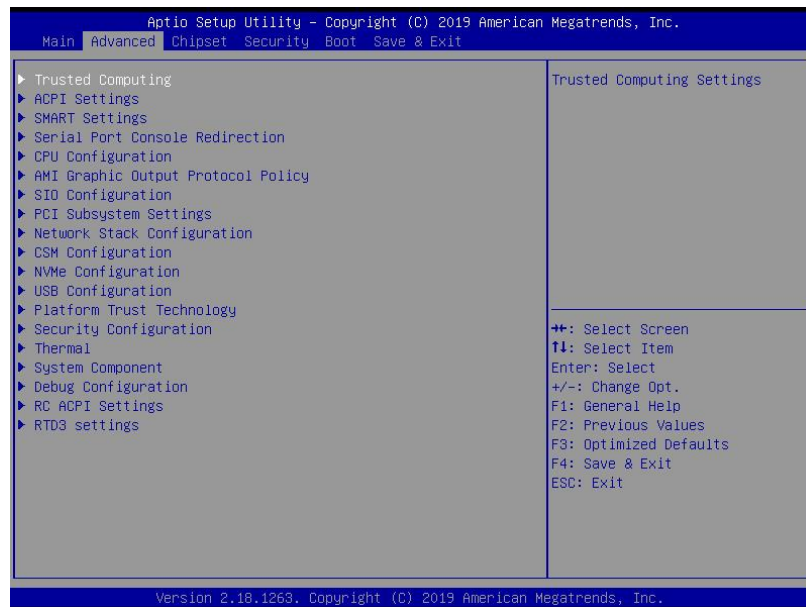


Figure 4-3: Advanced Menu

- 1) Trusted Computing
- 2) ACPI Settings
- 3) SMART Setting
- 4) Serial Port Console Redirection
- 5) CPU Configuration
- 6) AMI Graphic Output Protocol Policy
- 7) SIO Configuration
- 8) PCI Subsystem settings
- 9) Network Stack Configuration
- 10) CSM Configuration
- 11) NVMe Configuration
- 12) USB Configuration
- 13) Platform Trust Technology
- 14) Security Configuration
- 15) Thermal
- 16) System Component
- 17) Debug Configuration
- 18) RC ACPI Settings
- 19) RTD3 Setting

4.5 Chipset

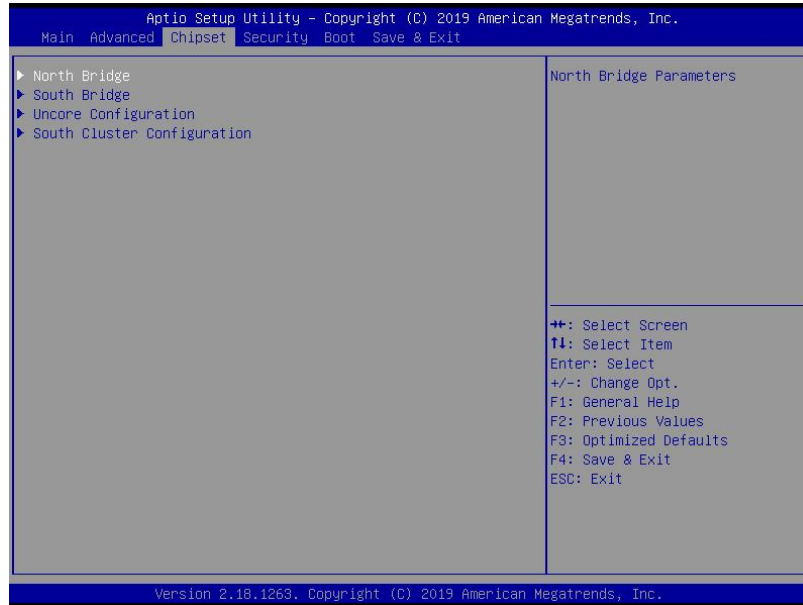


Figure 4.4: Chipset Menu

- 1) North Bridge
- 2) South Bridge
- 3) Uncore Configuration
- 4) South Cluster Configuration

4.6 Security (Administrator/User & P/W)

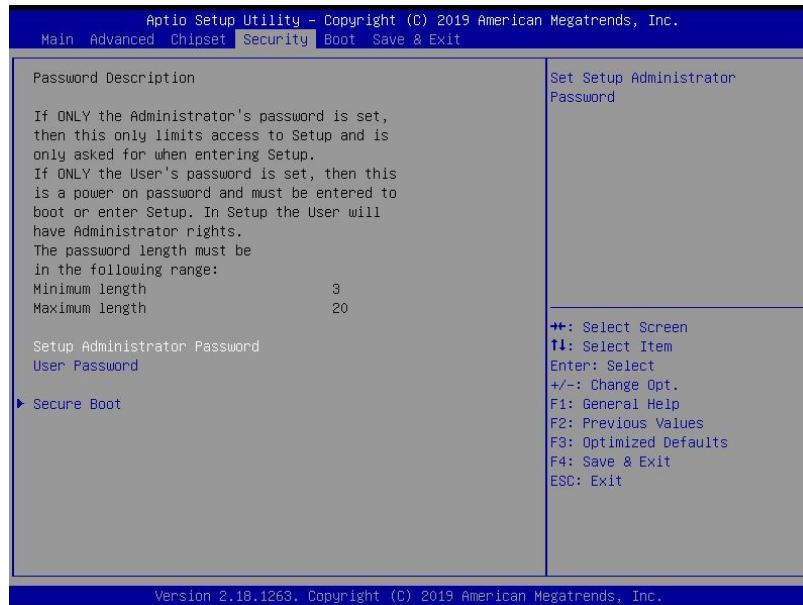


Figure 4.5: Security Menu

- 1) Setup Administrator Password: option to set superuser password, this password with the highest permissions

When you choose this option, following information will appear: Create New Password

Insert password (max 20 characters) and click <Enter>. BIOS requires confirming the password and after entering the password, BIOS will save the password. Once password is set up, you will be asked to enter your password each time you enter BIOS Setting program. This will prevent unauthorized user using your computer.

- 2) User Password: option to set user password, this password permission is restricted and partial settings cannot be changed.

When you choose this option, following information will appear: Create New Password

Insert password (max 20 characters) and click <Enter>. BIOS requires confirming the password and after entering the password, BIOS will save the password. Once password is set up, you will be asked to enter your password each time you enter BIOS Setting program.

Secure Boot

[Disabled]/ [Enabled]

4.7 Boot (Startup configuration feature)



Figure 4.6: Boot Menu

1) Boot Configuration

Setup Prompt Timeout

Starting up POST dwell time, the larger the value, the longer the dwell time

Bootup NumLock State

[On]/[Off]. This option specifies the status of the Num Lock key on the keyboard after the computer is started.

Quiet Boot

[Disabled]/[Enabled]. This option specifies whether LOGO should be displayed during starting up.

2) Boot Option Priorities

Boot Option #1

Boot Option #2

Boot Option #3

Fast Boot: [Disabled]/ [Enabled]

3) New Boot Option Policy: [Default]/ [Place First] / [Place Last]

4.8 Save & Exit

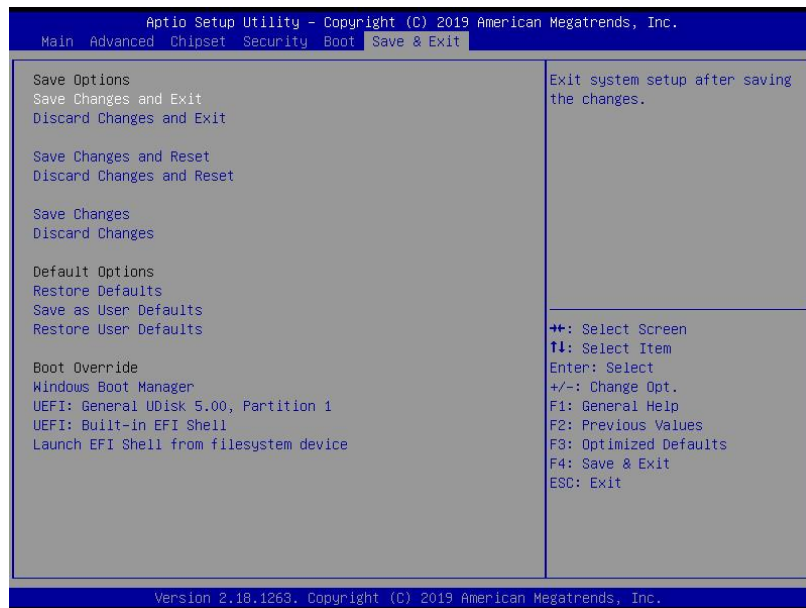


Figure 4.7: Save & Exit Menu

1) Save Options

Save Changes and exit

Discard Changes and Exit

Save Changes and Reset

Discard Changes and Reset

Save Changes

Discard Changes

2) Defaults Options

Restore Defaults (Load Optimal Defaults)

This option on the Main Menu allows the user to restore all BIOS options to their optimized values.

The default value of optimization is the default value set to optimize the performance of the motherboard. If you select YES and press Enter, you can save all the setting results to CMOS SRAM and leave the BIOS setting. If you do not want to save, select NO to return Main Menu.

Save as User Defaults

Restore as User Defaults

3) Boot Override: direct boot