



***AXIOMTEK***

## **MANO315 Series**

**Intel® Celeron® J3355 Processor  
Mini ITX Motherboard**

**User's Manual**



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## **CAUTION**

If you replace wrong batteries, it causes the danger of explosion. It is recommended by the manufacturer that you follow the manufacturer's instructions to only replace the same or equivalent type of battery, and dispose of used ones.

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## ESD Precautions

Computer boards have integrated circuits sensitive to static electricity. To prevent chipsets from electrostatic discharge damage, please take care of the following jobs with precautions:

- Do not remove boards or integrated circuits from their anti-static packaging until you are ready to install them.
- Before holding the board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. It discharges static electricity from your body.
- Wear a wrist-grounding strap, available from most electronic component stores, when handling boards and components.

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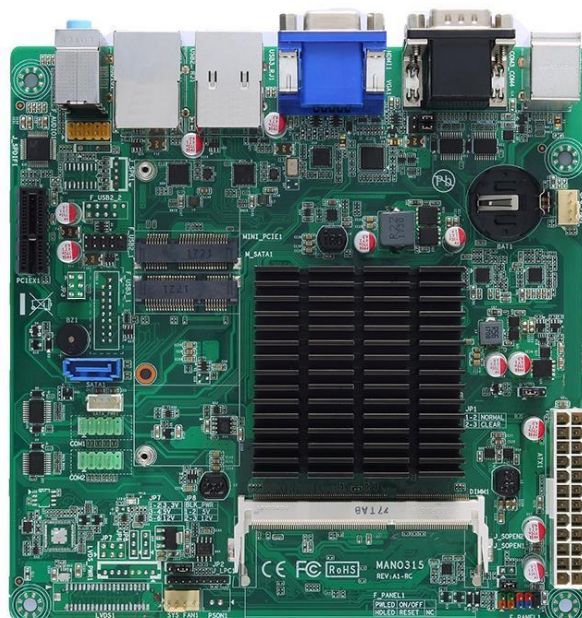
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# Chapter 1

## Introduction



The MANO315 is a Mini ITX board based on Intel® Celeron® J3355 processor. It delivers outstanding system performance through high-bandwidth interfaces, multiple I/O functions for interactive applications and various embedded computing solutions. There are two 204-pin DDR3L SO-DIMM sockets for DDR3L 1866MHz memory with maximum capacity up to 8GB. This Mini ITX board features two Gigabit Ethernet ports, one SATA 3.0 port with maximum transfer rate up to 6Gb/s, four USB 3.0 (rear I/O) and two USB 2.0 (internal) high speed compliant ports that can achieve the best stability and reliability for industrial applications.

### 1.1 Features

- Intel® Celeron® dual core J3355 (2~2.5GHz)
- 1 DDR3L 1866MHz memory with maximum capacity up to 8GB
- 1 PCI-Express x1
- 1 PCI-Express Mini Card
- 1 SATA-600
- 1 mSATA support
- 2 USB 3.0 and 4 USB 2.0 ports
- 4 COM ports supported
- Dual view displays
- Display: VGA/HDMI

## 1.2 Specifications

- **CPU**
  - Intel® Celeron® dual core J3355 2GHz up to 2.5GHz.
- **Chipset**
  - SoC integrated.
- **BIOS**
  - AMI BIOS.
- **System Memory**
  - One 204-pin SO-DIMM sockets.
  - Maximum up to 8GB DDR3L memory.
  - Support 1866MHz memory.
- **Onboard Multi I/O**
  - Controller: IT8786.
  - One PS/2 keyboard and mouse on the rear I/O.
  - Four serial ports:
    - COM1~COM2 support RS-232 (internal).
    - COM3~COM4 support RS-232 (rear I/O).
- **USB Interface**
  - Two USB 3.0 ports (rear I/O).
  - Four USB 2.0 ports (2 in box header, 2 on the rear I/O)
- **Ethernet**
  - Two Realtek RTL8111F GbE LAN ports.
  - Support 1000/100/10Mbps Gigabit/Fast Ethernet with Wake-on-LAN and PXE Boot ROM.
- **Serial ATA**
  - One SATA 3.0 port (6Gb/s).
- **Audio**
  - Realtek ALC662 5.1 channel HDA codec.
  - Support MIC-in/line-in/line-out.
- **Display**
  - One 15-pin D-Sub as VGA connector. Resolution max. up to 1920x1200.
  - One HDMI with resolution max. up to 3840x2160 @30Hz or 2560x1600 @60Hz.



- **Expansion Interface**
  - One PCI-Express x1 slot.
  - One PCI-Express Mini Card.
  - One mSATA.
- **Power Input**
  - One 12V ATX power input connector for CPU power.
- **Operating Temperature**
  - 0~60°C.
- **Storage Temperature**
  - -10~65°C.
- **Form Factor**
  - Mini ITX (6.7" x 6.7", 17.0cm x 17.0cm).



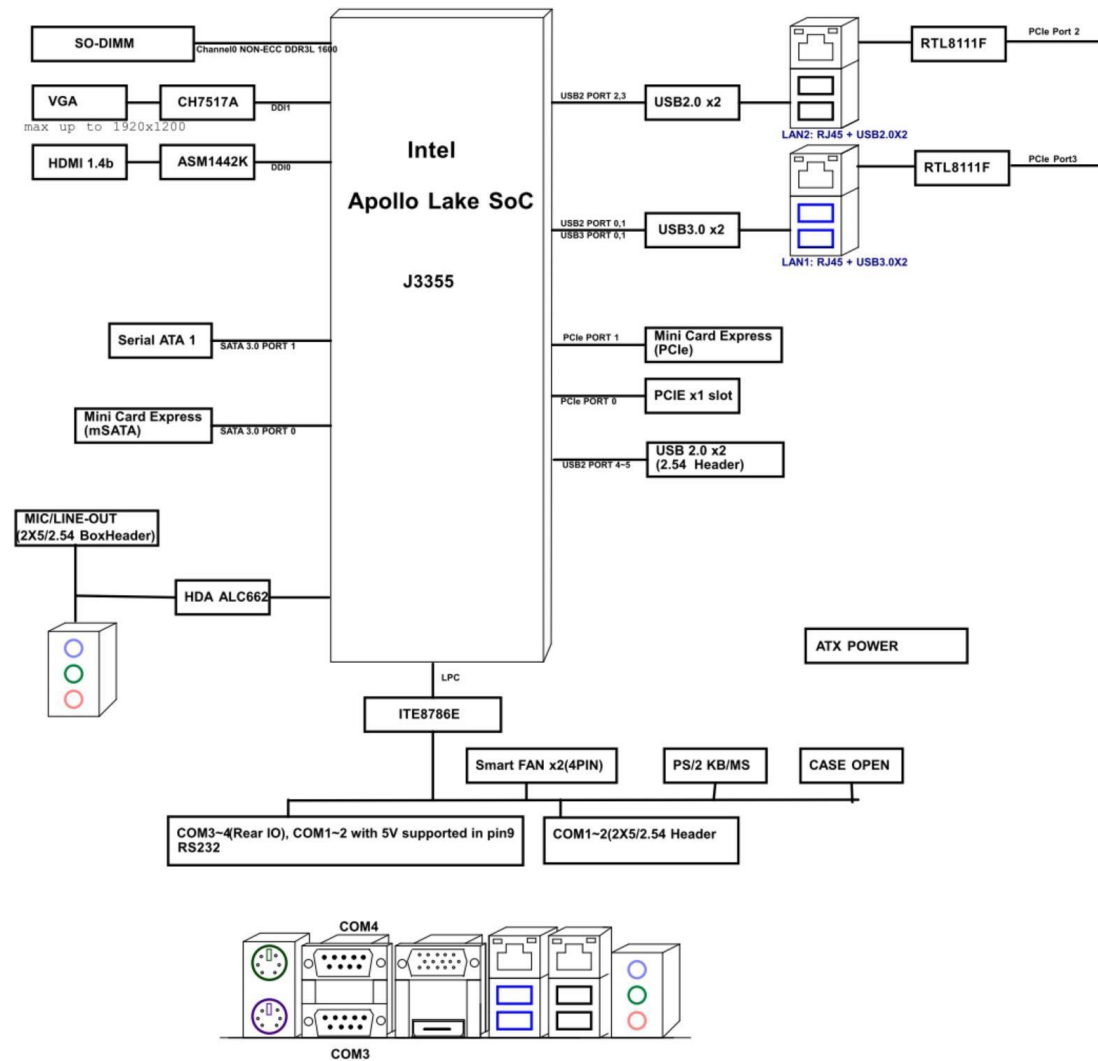
Note

*All specifications and images are subject to change without notice.*

## 1.3 Utilities Supported

- Chipset driver
- Ethernet driver
- Graphics driver
- Audio driver
- Intel TXE
- SerialIO

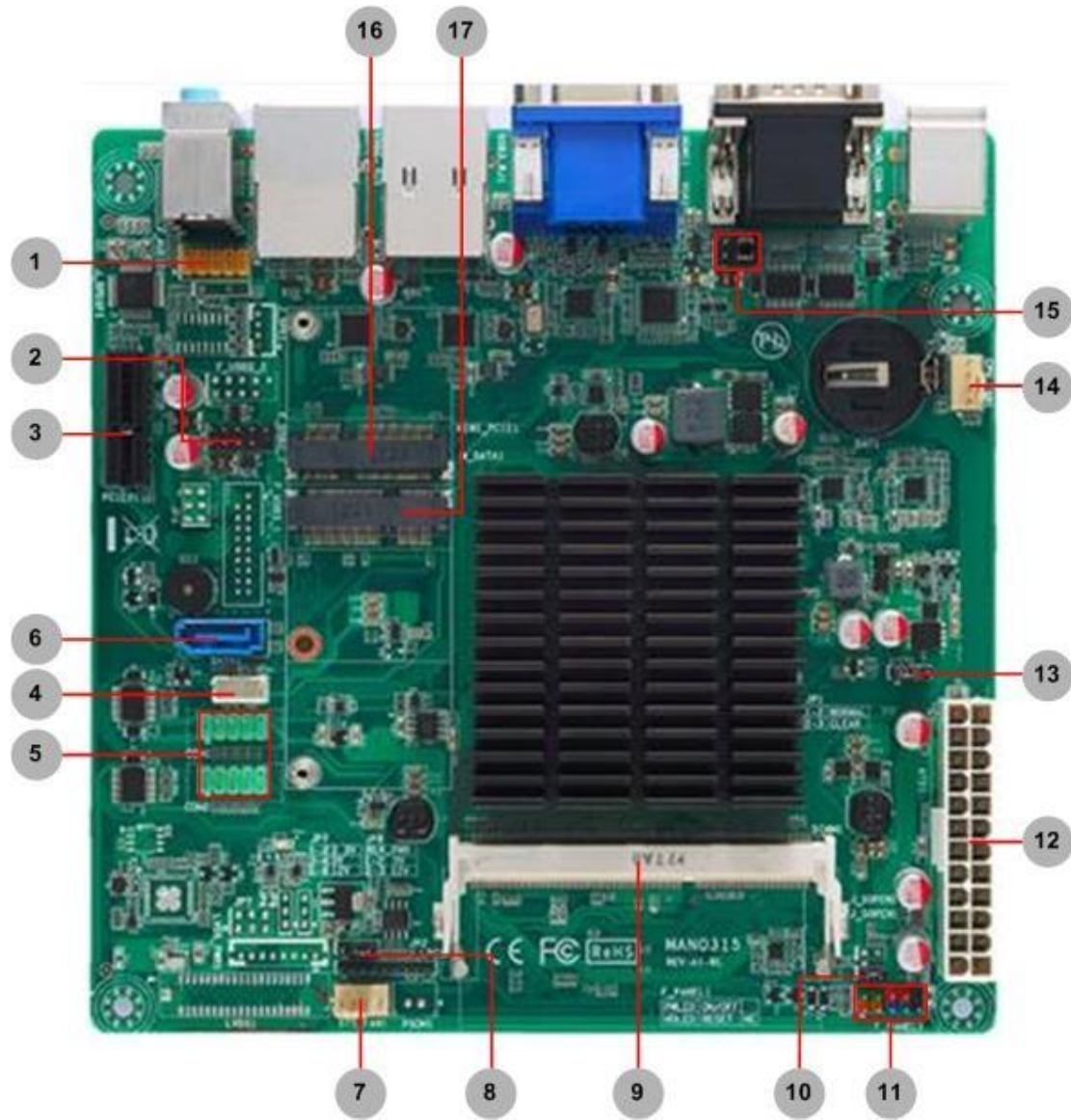
## 1.4 Block Diagram



# Chapter 2

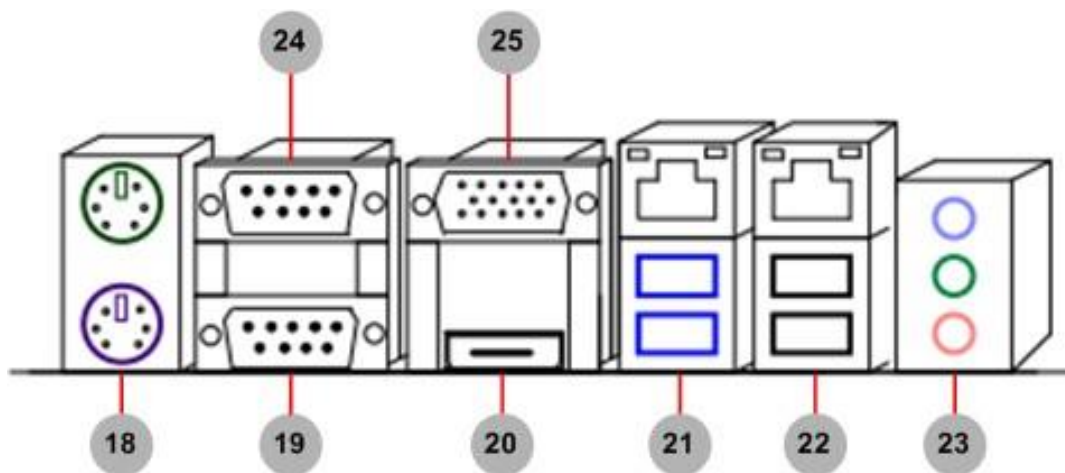
## Board and Pin Assignments

### 2.1 Board Layout



Top View

## 2.2 Rear I/O



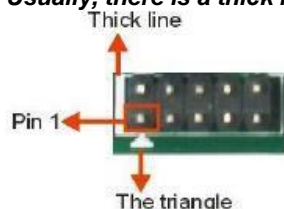
1	Front Audio Connector (F_AUDIO1)	14	CPU Fan Connector (CPU_FAN1)
2	Internal USB 2.0 Connector (F_USB2_1)	15	COM3/COM4 Data/Power Select Jumper (JP9)
3	PCI-Express x1 Slot (PCIEX1)	16	Half-size PCI-Express Mini Card Connector (MINI_PCIE1)
4	SATA Power Connector (SATA_PWR1)	17	Full-size mSATA Connector (M_SATA1)
5	Internal COM1 and COM2 Connectors (COM1, COM2)	18	PS/2 Keyboard and Mouse Connector (KBMS1)
6	SATA 3.0 Connector (SATA1)	19	COM3 D-Sub Connector (COM3)
7	System Fan Connector (SYS_FAN1)	20	HDMI Connector (HDMI1)
8	AT/ATX Power Mode Select Jumper (JP2)	21	LAN2 and USB 3.0 Connector (USB3_RJ1)
9	DDR3L SO-DIMM Connector (DIMM1)	22	LAN1 and USB 2.0 Connector (USB2_RJ1)
10	Case Open Header (J_SOPEN1)	23	Audio Jack (AUDIO1)
11	Front Panel Connector (F_PANEL1)	24	COM4 D-Sub Connector (COM4)
12	ATX Power Input Connector (ATX1)	25	VGA Connector (VGA1)
13	Clear CMOS Jumper (JP1)		



Note

To identify the first pin of a header or jumper, please refer to the following information:

- Usually, there is a thick line or a triangle near the header or jumper pin 1.

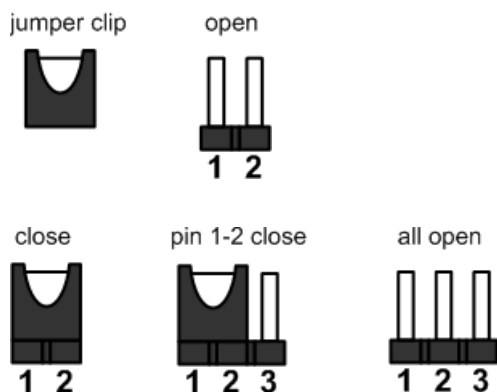


- Square pad, which you can find on the back of the motherboard, is usually used for pin 1.



## 2.3 Jumper Settings

Jumper is a small component consisting of jumper clip and jumper pins. Install jumper clip on 2 jumper pins to close. And remove jumper clip from 2 jumper pins to open. The following illustration shows how to set up jumper.



Before applying power to MANO315 Series, please make sure all of the jumpers are in factory default position. Below you can find a summary table of all jumpers and onboard default settings.



**Note**

*Once the default jumper setting needs to be changed, please do it under power-off condition.*

Jumper	Description	Setting	
JP1	Clear CMOS Default: Normal	1-2 Close	
JP2	AT/ATX Power Mode Select Default: ATX Mode	1-2 Close	
JP9	COM3/COM4 Data/Power Select Default: RS-232 Data	COM3 Pin 9: RI#	3-5 Close
		COM4 Pin 9: RI#	4-6 Close

### 2.3.1 Clear CMOS (JP1)

This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time, and system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS, which includes system setup information such as system passwords.

To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.
2. Remove the onboard battery.
3. Move the jumper clip from pins 1-2 (default) to pins 2-3. Keep the clip on pins 2-3 for about 5~10 seconds, then move the clip back to pins 1-2.
4. Re-install the battery.
5. Plug the power cord and turn ON the computer.
6. Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.

Function	Setting
Normal operation (Default)	1-2 close
Clear CMOS	2-3 close



### 2.3.2 AT/ATX Power Mode Select (JP2)

This 3-pin (pitch=2.54mm) jumper allows you to select AT or ATX power mode.

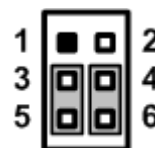
Function	Setting
ATX mode (Default)	1-2 close
AT mode	2-3 close



### 2.3.3 COM3/COM4 Data/Power Select (JP9)

This is a 3x2-pin (pitch=2.54mm) jumper. The COM3 and COM4 ports has +5V power capability on RI by setting JP9.

Function	Setting
Power: Set COM3 pin 9 to +5V	1-3 close
Data: Set COM3 pin 9 to RI (Default)	3-5 close
Power: Set COM4 pin 9 to +5V	2-4 close
Data: Set COM4 pin 9 to RI (Default)	4-6 close



## 2.4 Connectors

Signals go to other parts of the system through connectors. Loose or improper connection might cause problems, please make sure all connectors are properly and firmly connected. Here is a summary table showing connectors on the hardware.

Connector	Description
F_AUDIO1	Front Audio Connector
SATA_PWR1	SATA Power Connector
COM1, COM2	Internal COM1 and COM2 Connectors
CPU_FAN1, SYS_FAN1	CPU and System Fan Connectors
J_SOPEN1	Case Open Header
F_PANEL1	Front Panel Connector
ATX1	ATX Power Input Connector
F_USB2_1	Internal USB 2.0 Connector
PCIEX1	PCI-Express x1 Slot
SATA1	SATA 3.0 Connector
MINI_PCIE1	Half-size PCI-Express Mini Card Connector
M_SATA1	Full-size mSATA Connector
KBMS1	PS/2 Keyboard and Mouse Connector
COM3, COM4	COM3 and COM4 D-Sub Connectors
HDMI1	HDMI Connector
USB3_RJ1	LAN2 and USB 3.0 Connector
USB2_RJ1	LAN1 and USB 2.0 Connector
AUDIO1	Audio Jack
VGA1	VGA Connector
DIMM1	DDR3L SO-DIMM Connector

### 2.4.1 Front Audio Connector (F\_AUDIO1)

This is a 5x2-pin (pitch=2.54mm) front audio connector for convenient connection and control of audio devices.

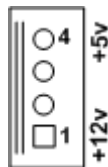
Pin	Signal	Pin	Signal
1	AUD_MIC_L	2	GND
3	AUD_MIC_R	4	PRESENCE#
5	AUD_OUT_R	6	MIC_RET
7	J_SENCE	8	
9	AUD_OUT_L	10	OUT_RET



### 2.4.2 SATA Power Connector (SATA\_PWR1)

This is a 4-pin (pitch=2.0mm) connector for DC +12V and +5V power output.

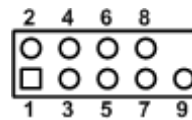
Pin	Signal
1	+12V
2	GND
3	GND
4	+5V



### 2.4.3 Internal COM Connectors (COM1 and COM2)

The motherboard has two 2x5-pin (pitch=2.54mm) internal connectors for COM1 and COM2 port interfaces.

Pin	Signal	Pin	Signal
1	DCD#	2	RXD#
3	TXD#	4	DTR#
5	GND	6	DSR#
7	RTS#	8	CTS#
9	RI#	10	N.C



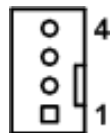


### 2.4.4 Fan Connectors (CPU\_FAN1 and SYS\_FAN1)

This motherboard has two 4-pin (pitch=2.54mm) fan connectors. You can find fan speed option(s) at BIOS Setup Utility: Advanced\HW Monitor\PC Health Status and Smart Fan Function in section 4.4.

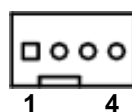
#### CPU\_FAN1:

Pin	Signal
1	GND
2	+12V
3	FAN Speed Detection
4	FAN Speed Control



#### SYS\_FAN1:

Pin	Signal
1	GND
2	+12V
3	FAN Speed Detection
4	N.C



### 2.4.5 Case Open Header (J\_SOPEN1)

This motherboard has one 2-pin (pitch=2.54mm) header for chassis intrusion detection feature.

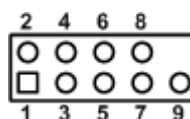
J_SOPEN1	Description
Close	Normal
Open	Active case open



## 2.4.6 Front Panel Connector (F\_PANEL1)

This is a 2x5-pin (pitch=2.54mm) connector for front panel interface.

Pin	Signal
1	HD LED+
2	Power LED+
3	HD LED-
4	Power LED-
5	SYS_RESET-
6	PWR+
7	SYS_RESET+
8	PWR-
9	N.C



### HDD Activity LED

This connection is linked to hard drive activity LED on the control panel. LED flashes when HDD is being accessed. Pin 1 and 3 connect the hard disk drive to the front panel HDD LED, pin 3 is assigned as cathode(-) and pin 1 is assigned as anode(+).

### Power LED

Pin 2 connects anode(+) of LED and pin 4 connects cathode(-) of LED. The power LED lights up when the system is powered on.

### System Reset Switch

Pin 5 and 7 connect the case-mounted reset switch that reboots your computer without turning off the power switch. It is a better way to reboot your system for a longer life of system power supply.

### Power On/Off Button

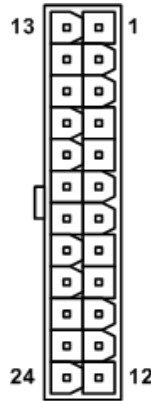
Pin 6 and 8 connect the power button on front panel to the board, which allows users to turn on or off power supply.

### 2.4.7 ATX Power Input Connector (ATX1)

Steady and sufficient power can be supplied to all components on the board by connecting the power connector. Please make sure all components and devices are properly installed before connecting the power connector.

The ATX1 is a 12x2-pin connector for power input interface. External power supply plug fits into ATX1 in only one orientation. Properly press down power supply plug until it completely and firmly fits into this connector. Loose connection may cause system instability.

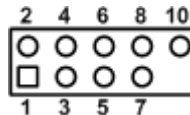
Pin	Signal	Pin	Signal
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS_ON#
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	ATX_PG	20	N.C
9	+5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND



### 2.4.8 Internal USB 2.0 Connector (F\_USB2\_1)

This is a 2x5-pin (pitch=2.54mm) connector for USB 2.0 interface.

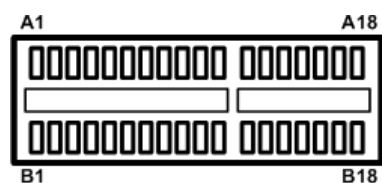
Pin	Signal	Pin	Signal
1	+5V	2	+5V
3	USB2_N4	4	USB2_N5
5	USB2_P4	6	USB2_P5
7	GND	8	GND
		10	N.C



### 2.4.9 PCI-Express x1 Slot (PCIEX1)

This motherboard has one PCI-Express x1 slot.

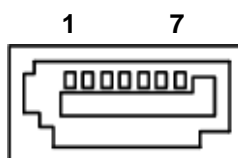
Pin	Signal	Pin	Signal
B1	+12V	A1	PRSNT1#
B2	+12V	A2	+12V
B3	N.C	A3	+12V
B4	GND	A4	GND
B5	SMCLK	A5	N.C
B6	SMDAT	A6	N.C
B7	GND	A7	N.C
B8	+3.3V	A8	N.C
B9	N.C	A9	+3.3V
B10	3.3VSB	A10	+3.3V
B11	WAKE#	A11	PERST#
B12	N.C	A12	GND
B13	GND	A13	REFCLK+
B14	HSOP0	A14	REFCLK-
B15	HSO0	A15	GND
B16	GND	A16	HSIP0
B17	N.C	A17	HSIN0
B18	GND	A18	GND



### 2.4.10 SATA 3.0 Connector (SATA1)

This Serial Advanced Technology Attachment (Serial ATA or SATA) connector is for SATA 3.0 interface allowing up to 6.0Gb/s data transfer rate. It is a computer bus interface for connecting to devices such as hard disk drive.

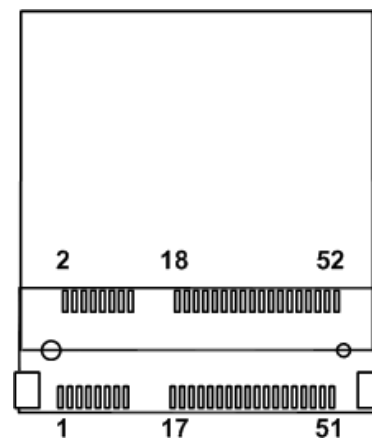
Pin	Signal
1	GND
2	SATA_TX+
3	SATA_TX-
4	GND
5	SATA_RX-
6	SATA_RX+
7	GND



### 2.4.11 Half-size PCI-Express Mini Card Connector (MINI\_PCIE1)

This is a half-size PCI-Express Mini Card connector applying to PCI-Express. It also complies with PCI-Express Mini Card Spec. V1.2.

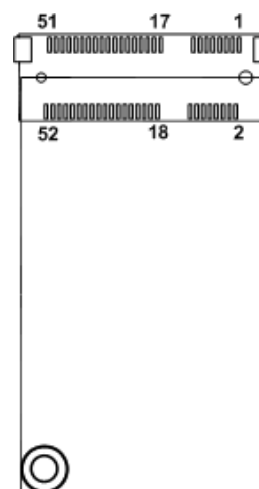
Pin	Signal	Pin	Signal
1	WAKE#	2	+3.3VAUX
3	N.C	4	GND
5	N.C	6	+1.5V
7	CLKREQ#	8	N.C
9	GND	10	N.C
11	CLKOUT_PCIE_N	12	N.C
13	CLKOUT_PCIE_P	14	N.C
15	GND	16	N.C
17	N.C	18	GND
19	N.C	20	N.C
21	GND	22	PERST#
23	PCIE1_RX_N	24	+3.3VAUX
25	PCIE1_RX_D	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PCIE1_TX_N	32	SMB_DATA
33	PCIE1_TX_P	34	GND
35	GND	36	N.C
37	GND	38	N.C
39	+3.3VSB	40	GND
41	+3.3VSB	42	N.C
43	GND	44	N.C
45	N.C	46	N.C
47	N.C	48	+1.5V
49	N.C	50	GND
51	N.C	52	+3.3VAUX



### 2.4.12 Full-size mSATA Connector (M\_SATA1)

This is a full-size mSATA connector.

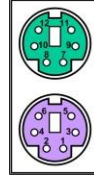
Pin	Signal	Pin	Signal
1	N.C	2	+3.3V
3	N.C	4	GND
5	N.C	6	+V1.5S
7	N.C	8	N.C
9	GND	10	N.C
11	N.C	12	N.C
13	N.C	14	N.C
15	GND	16	N.C
17	N.C	18	GND
19	N.C	20	N.C
21	GND	22	PLTRST_1_N
23	SATA0_RX_DP	24	+3.3V
25	SATA0_RX_DN	26	GND
27	GND	28	+V1.5S
29	GND	30	N.C
31	SATA0_TX_DN	32	N.C
33	SATA0_TX_DP	34	GND
35	GND	36	N.C
37	GND	38	N.C
39	+3.3V	40	GND
41	+3.3V	42	N.C
43	GND	44	N.C
45	N.C	46	N.C
47	N.C	48	+V1.5S
49	GND	50	GND
51	N.C	52	+3.3V



### 2.4.13 PS/2 Keyboard and Mouse Connector (KBMS1)

The motherboard has two 6-pin mini-DIN PS/2 connectors; green for mouse and purple for keyboard.

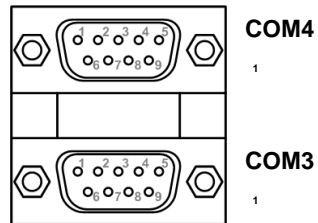
Pin	Signal	Pin	Signal
1	K/B Data	7	M/S Data
2	N.C	8	N.C
3	GND	9	GND
4	+5V	10	+5V
5	K/B CLK	11	M/S CLK
6	N.C	12	N.C



### 2.4.14 COM D-Sub Connectors (COM3 and COM4)

These are double-deck 9-pin D-Sub connectors for COM3 and COM4 port interfaces.

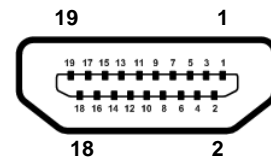
Pin	Signal	Pin	Signal
1	DCD#	2	RXD#
3	TXD#	4	DTR#
5	GND	6	DSR#
7	RTS#	8	CTS#
9	RI#		



### 2.4.15 HDMI Connector (HDMI1)

The HDMI (High-Definition Multimedia Interface) is a compact digital interface which is capable of transmitting high-definition video and high-resolution audio over a single cable.

Pin	Signal	Pin	Signal
1	HDMI OUT_DATA2+	2	GND
3	HDMI OUT_DATA2-	4	HDMI OUT_DATA1+
5	GND	6	HDMI OUT_DATA1-
7	HDMI OUT_DATA0+	8	GND
9	HDMI OUT_DATA0-	10	HDMI OUT_Clock+
11	GND	12	HDMI OUT_Clock-
13	N.C	14	RSVD
15	HDMI OUT_SCL	16	HDMI OUT_SDA
17	GND	18	+5V
19	HDMI_HTPLG		

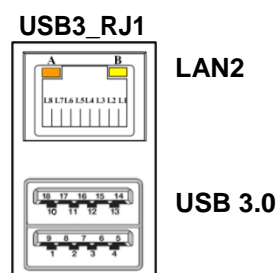


## 2.4.16 LAN and USB 3.0/2.0 Connectors (USB3\_RJ1 and USB2\_RJ1)

The motherboard comes with two high performance plug and plays Ethernet interfaces (in RJ-45) which are fully compliant with the IEEE 802.3 standard. Connection can be established by plugging one end of the Ethernet cable into this RJ-45 connector and the other end to a 1000/100/10-Base-T hub.

The USB 3.0 and USB 2.0 connectors on the rear I/O are for installing USB peripherals such as keyboard, mouse, scanner, etc.

Pin	LAN Signal	Pin	LAN Signal
L1	Tx+ (Data transmission positive)	L2	Tx- (Data transmission negative)
L3	Rx+ (Data reception positive)	L4	RJ-1 (For 1000 Base-T only)
L5	RJ-1 (For 1000 Base-T only)	L6	Rx- (Data reception negative)
L7	RJ-1 (For 1000 Base-T only)	L8	RJ-1 (For 1000 Base-T only)
A	Speed LED <sup>[1]</sup>	B	Active LED

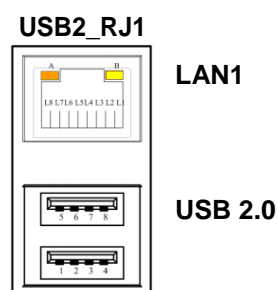


Note

- Speed LED turns orange for 1000Mbps or green for 100Mbps.

Pin	USB 3.0 Signal	Pin	USB 3.0 Signal
1	USB_VCC (+5V_SBY)	10	USB_VCC (+5V_SBY)
2	USB #0_D-	11	USB #1_D-
3	USB #0_D+	12	USB #1_D+
4	GND	13	GND
5	SSRX0-	14	SSRX1-
6	SSRX0+	15	SSRX1+
7	GND	16	GND
8	SSTX1-	17	SSTX2-
9	SSTX1+	18	SSTX2+

Pin	LAN Signal	Pin	LAN Signal
L1	Tx+ (Data transmission positive)	L2	Tx- (Data transmission negative)
L3	Rx+ (Data reception positive)	L4	RJ-1 (For 1000 Base-T only)
L5	RJ-1 (For 1000 Base-T only)	L6	Rx- (Data reception negative)
L7	RJ-1 (For 1000 Base-T only)	L8	RJ-1 (For 1000 Base-T only)
A	Speed LED <sup>[1]</sup>	B	Active LED





Pin	USB 2.0 Signal	Pin	USB 2.0 Signal
1	+5V_SBY	2	USB #3_D-
3	USB #3_D-	4	GND
5	+5V_SBY	6	USB #2_D-
7	USB #2_D-	8	GND

### 2.4.17 Audio Jack (AUDIO1)

The motherboard provides HD audio jack on the rear I/O. Install audio driver, and then attach audio devices to AUDIO1.

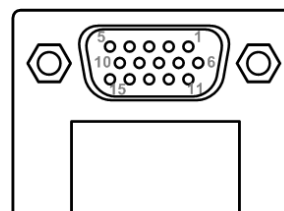
Pin Color	Signal
Blue	Line-in
Green	Line-out
Pink	MIC-in



### 2.4.18 VGA Connector (VGA1)

The VGA1 is a high rise 15-pin D-Sub connector commonly used for VGA display. This VGA interface configuration can be configured via software utility.

Pin	Signal	Pin	Signal
1	Red	2	Green
3	Blue	4	NC
5	GND	6	DETECT
7	GND	8	GND
9	VCC	10	GND
11	NC	12	DDC DATA
13	Horizontal Sync	14	Vertical Sync
15	DDC CLK		



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# Chapter 3

## Hardware Description

### 3.1 Microprocessors

The MANO315 supports Intel® Celeron® J3355 processor, which enable your system to operate under Windows® 10 and Linux environments. The system performance depends on the microprocessor. Make sure all correct settings are arranged for your installed microprocessor to prevent the CPU from damages.

### 3.2 BIOS

The MANO315 uses AMI Plug and Play BIOS with a single SPI Flash.

### 3.3 System Memory

The MANO315 supports one 204-pin DDR3L SO-DIMM socket for maximum memory capacity up to 8GB DDR3L SDRAMs. The memory module comes in sizes of 2GB, 4GB and 8GB.

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# Chapter 4

## AMI BIOS Setup Utility

The AMI UEFI BIOS provides users with a built-in setup program to modify basic system configuration. All configured parameters are stored in a flash chip to save the setup information whenever the power is turned off. This chapter provides users with detailed description about how to set up basic system configuration through the AMI BIOS setup utility.

### 4.1 Starting

To enter the setup screens, follow the steps below:

1. Turn on the computer and press <Del> during the Power On Self Test (POST) to enter BIOS setup, otherwise, POST will continue with its test routines.
2. Once you enter the BIOS, the main BIOS setup menu displays. You can access the other setup screens from the main BIOS setup menu, such as the Advanced and Chipset menus.



**Note**

*If your computer cannot boot after making and saving system changes with BIOS setup, you can restore BIOS optimal defaults by setting JP1 (see section 2.3.1).*

It is strongly recommended that you should avoid changing the chipset's defaults. Both AMI and your system manufacturer have carefully set up these defaults that provide the best performance and reliability.

### 4.2 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. These keys include <F1>, <F2>, <Enter>, <ESC>, <Arrow> keys, and so on.



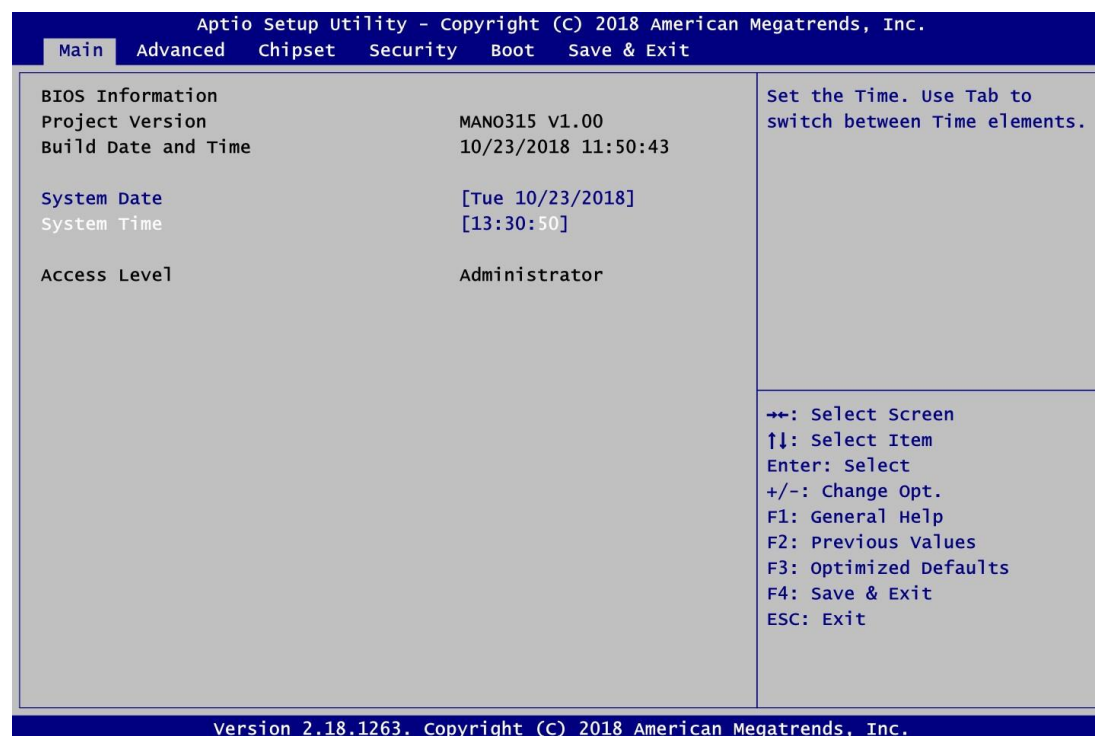
**Note**

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

Hot Keys	Description
→← Left/Right	The Left and Right <Arrow> keys allow you to select a setup screen.
↑↓ Up/Down	The Up and Down <Arrow> keys allow you to select a setup screen or sub screen.
Enter	The <Enter> key allows you to display or change the setup option listed for a particular setup item. The <Enter> key can also allow you to display the setup sub screens.
+– Plus/Minus	The Plus and Minus <Arrow> keys allow you to change the field value of a particular setup item.
F1	The <F1> key allows you to display the General Help screen.
F2	The <F2> key allows you to Load Previous Values.
F3	The <F3> key allows you to Load Optimized Defaults.
F4	The <F4> key allows you to save any changes you have made and exit Setup. Press the <F4> key to save your changes.
Esc	The <Esc> key allows you to discard any changes you have made and exit the Setup. Press the <Esc> key to exit the setup without saving your changes.

## 4.3 Main Menu

When you first enter the setup utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab. System Time/Date can be set up as described below. The Main BIOS setup screen is shown below.



### BIOS Information

Display the BIOS information.

### System Date/Time

Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

### Access Level

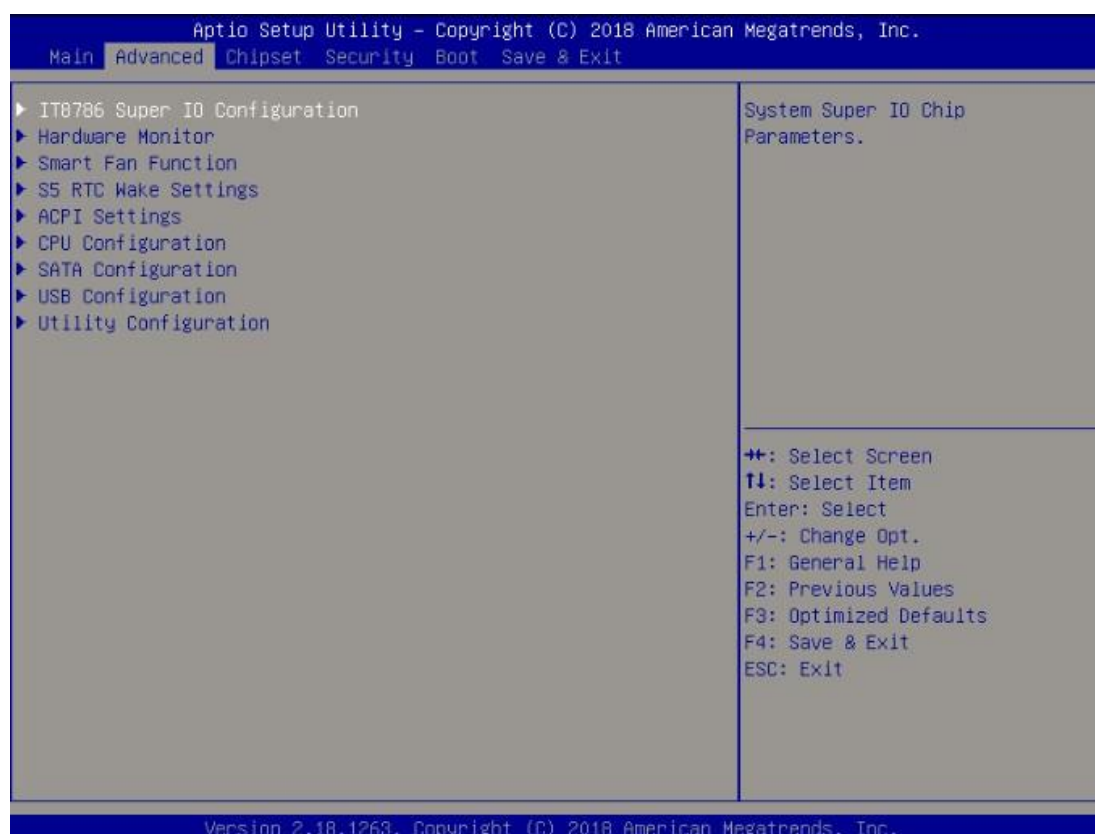
Display the access level of current user.

## 4.4 Advanced Menu

The Advanced menu also allows users to set configuration of the CPU and other system devices. You can select any of the items in the left frame of the screen to go to the sub menus:

- ▶ IT8786 Super IO Configuration
- ▶ Hardware Monitor
- ▶ Smart Fan Function
- ▶ S5 RTC wake settings
- ▶ ACPI Settings
- ▶ CPU Configuration
- ▶ SATA Configuration
- ▶ USB Configuration
- ▶ Utility Configuration

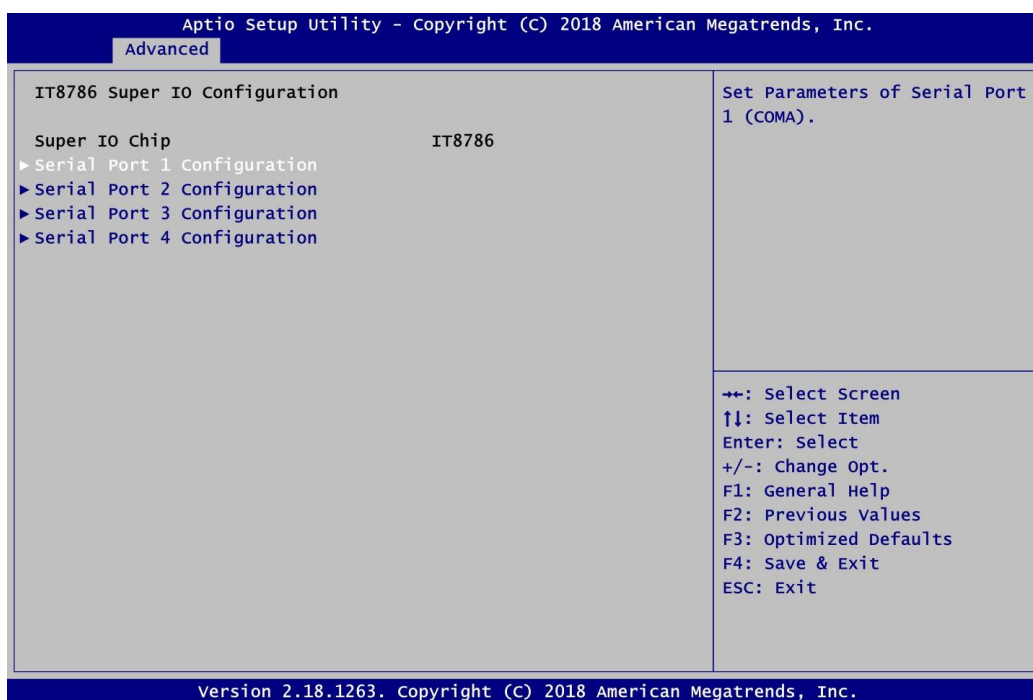
For items marked with “▶”, please press <Enter> for more options.





- **IT8786 Super IO Configuration**

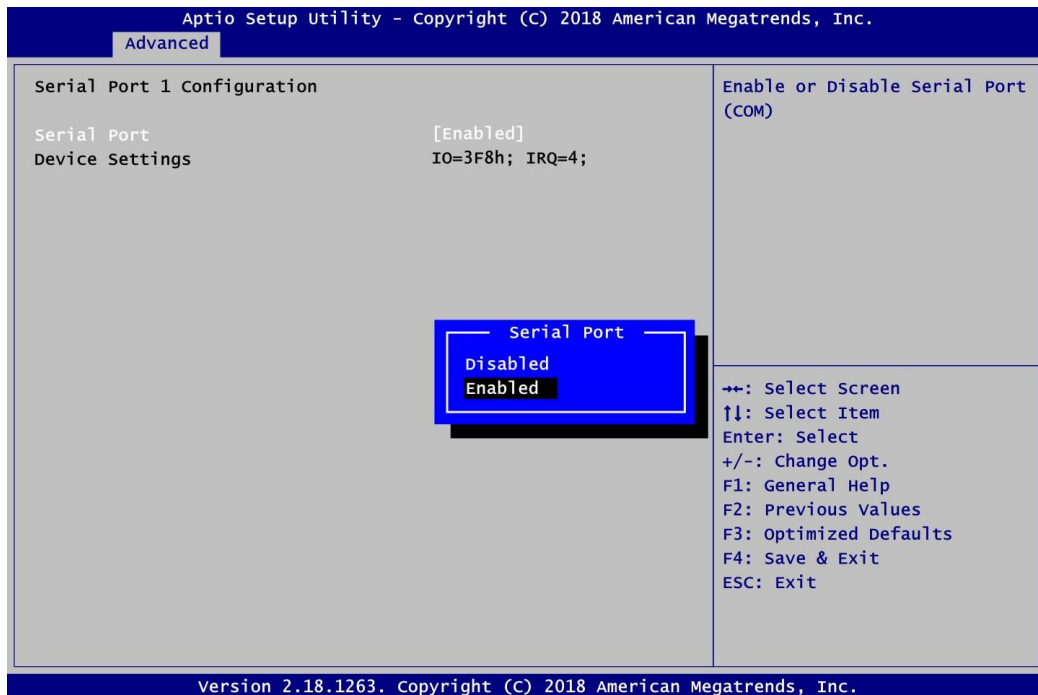
You can use this screen to select options for the Super IO Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen. For items marked with "▶", please press <Enter> for more options.



#### **Serial Port 1~4 Configuration**

Use these items to set parameters related to serial port 1~4.

● **Serial Port 1~4 Configuration**



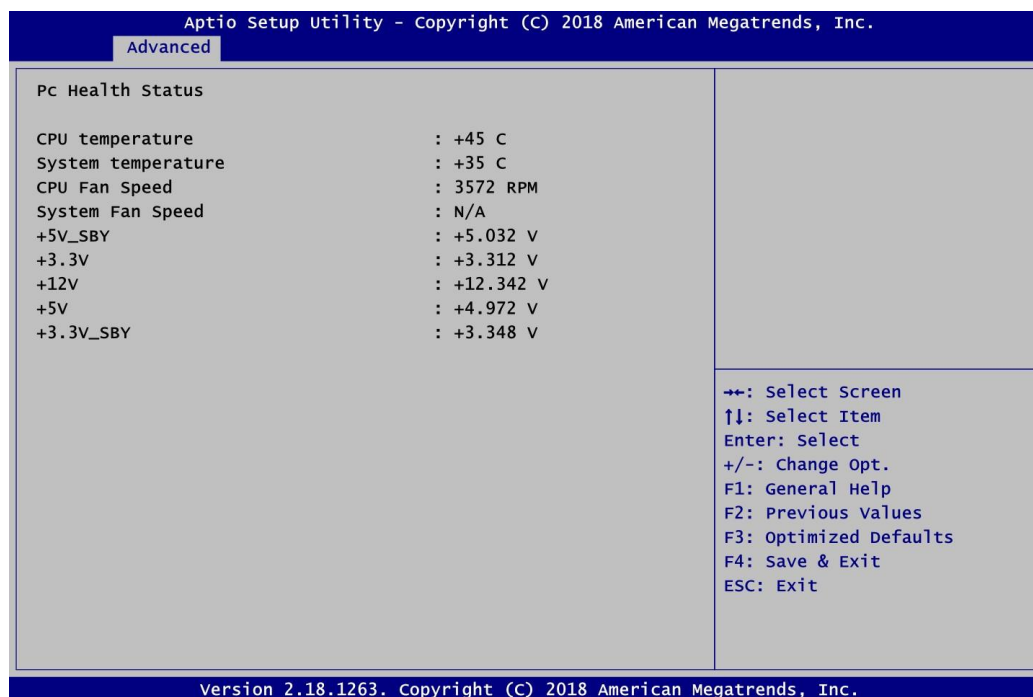
**Serial Port**

Enable or disable serial port 1~4. The optimal settings for base I/O address and for interrupt request address are:

- Serial port 1: 3F8h, IRQ4
- Serial port 2: 2F8h, IRQ5
- Serial port 3: 3E8h, IRQ6
- Serial port 4: 2E8h, IRQ7

- **Hardware Monitor**

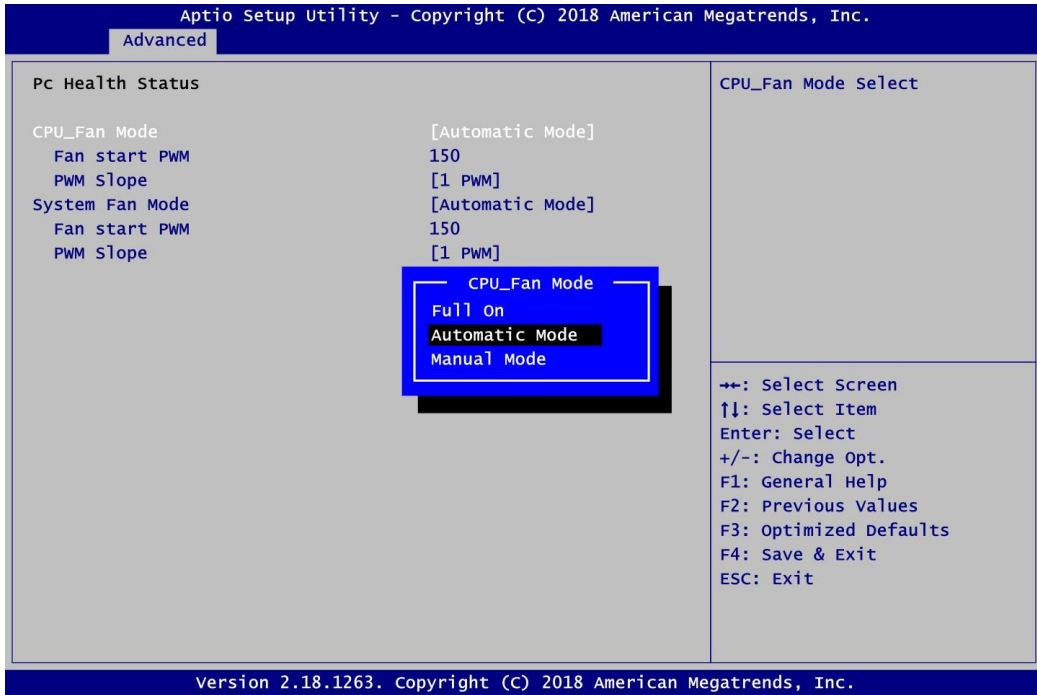
This screen monitors hardware health status.



This screen displays the temperature of system and CPU, cooling fans speed in RPM and system voltages (+5V standby, +3.3V, +12V, +5V and +3.3V standby).

● **Smart Fan Function**

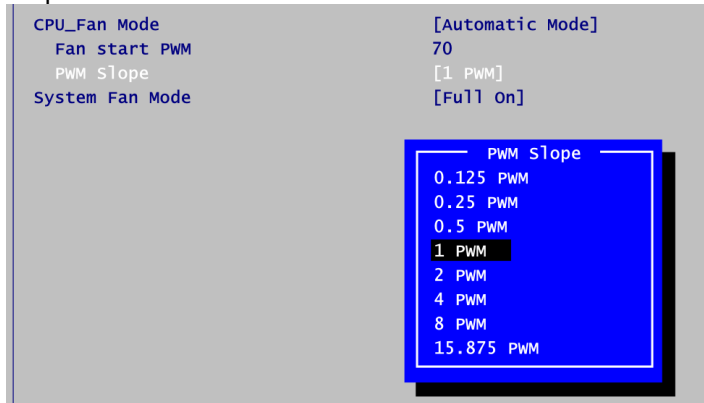
This screen allows you to select CPU fan and system fan mode.



**CPU\_Fan\System Fan Mode**

This item allows you to select CPU\_Fan\System fan mode: Full On, Automatic or Manual Mode.

- Full On: The fan always runs at full speed.
- Automatic Mode: The following option selections appear only in Automatic Mode. The initial spinning speed of fan is determined according to start PWM value. The PWM Slope is used to control how fast the fan speeds up or slows down; larger value means faster. When temperature gets higher, the fan increases its speed according to PWM Slope.

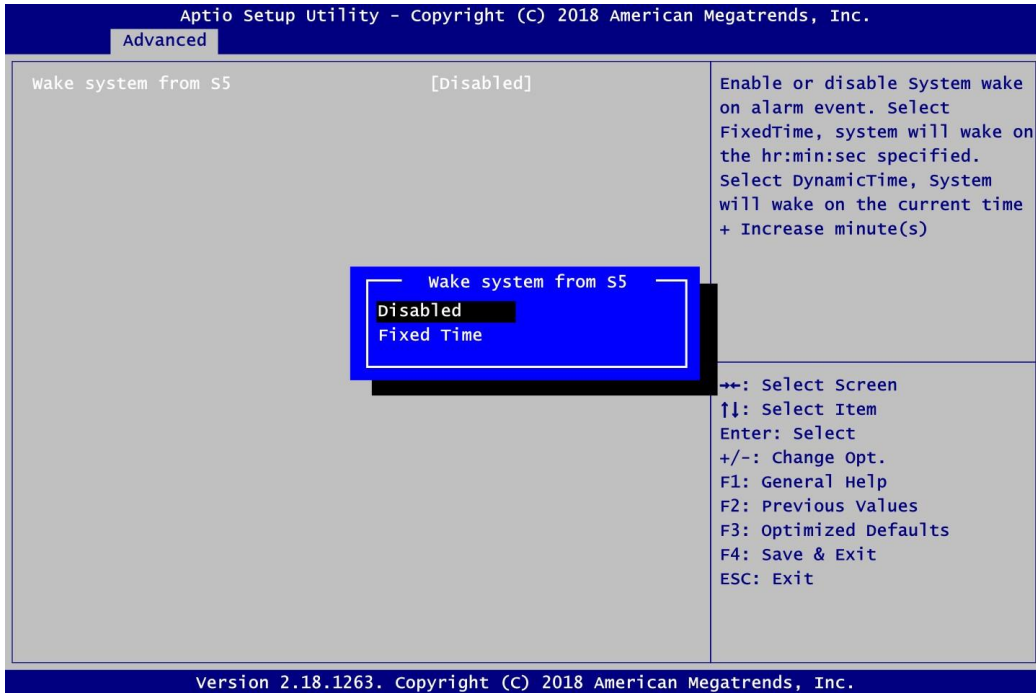


- Manual Mode: Use the start PWM value to set fan speed manually. The range is from 0 to 255.



- **S5 RTC Wake Settings**

You can use this screen to select options for the ACPI configuration.

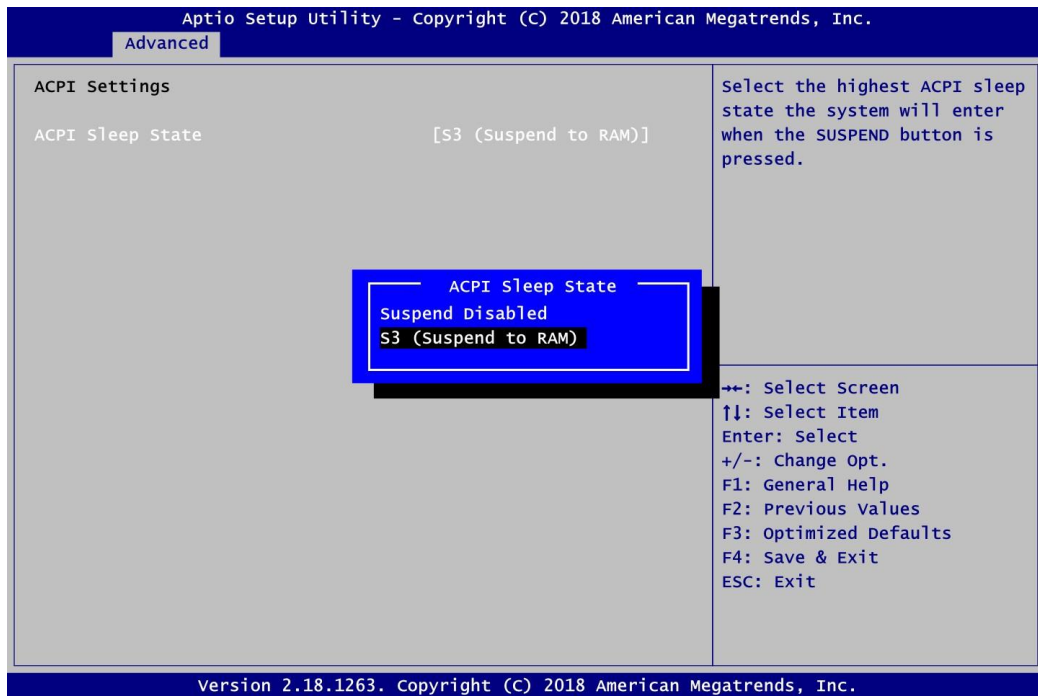


**Wake system from S5**

Enable or disable system wake on alarm event. It allows you to wake up the system in a certain time. Select Fixed Time to set the system to wake on the specified time.

- **ACPI Settings**

You can use this screen to select options for the ACPI configuration.

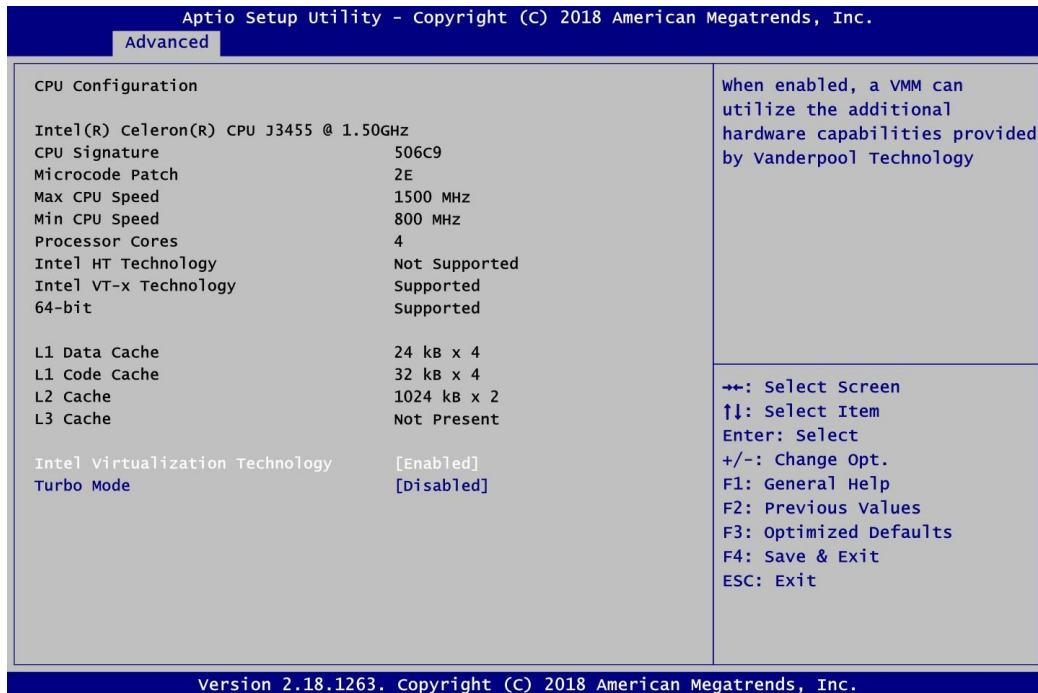


**ACPI Sleep State**

Select the ACPI (Advanced Configuration and Power Interface) sleep state. Configuration options are Suspend Disabled and S3 (Suspend to RAM). The default setting is S3 (Suspend to RAM); this option selects ACPI sleep state the system will enter when suspend button is pressed.

- **CPU Configuration**

This screen shows the CPU information, and you can change the value of the selected option.



**Intel Virtualization Technology**

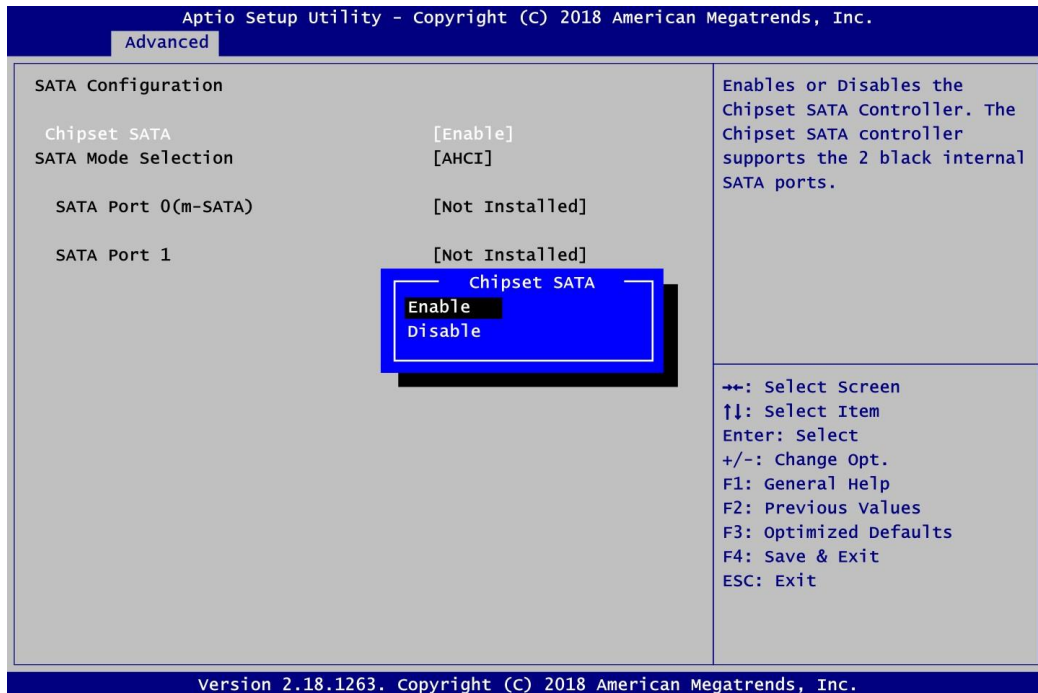
Enable or disable Intel Virtualization Technology. When enabled, a VMM (Virtual Machine Mode) can utilize the additional hardware capabilities. It allows a platform to run multiple operating systems and applications independently, hence enabling a computer system to work as several virtual systems.

**Turbo Mode**

Enable or disable Intel® turbo boost mode allowing processor cores to run faster but not exceed CPU defined frequency limits.

- **SATA Configuration**

During system boot up, BIOS automatically detects the presence of SATA devices. In SATA Configuration menu, you can see the current installed hardware in SATA ports.



**Chipset SATA**

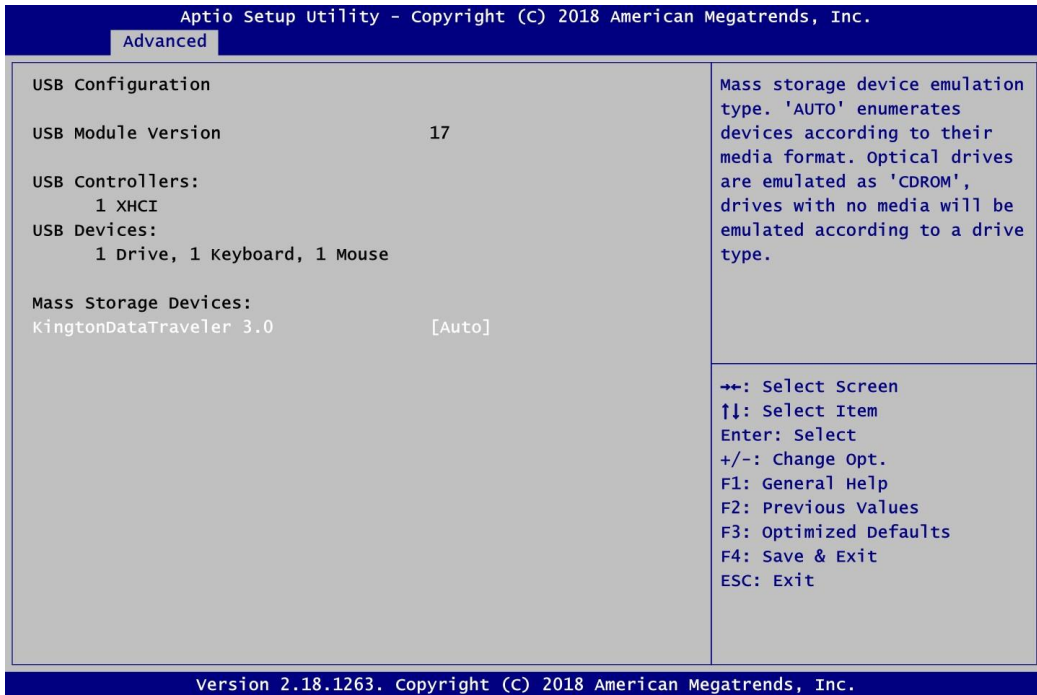
Enable or disable Chipset SATA Controller. The default is Enable.

**SATA Mode Selection**

The SATA mode is AHCI.



● **USB Configuration**



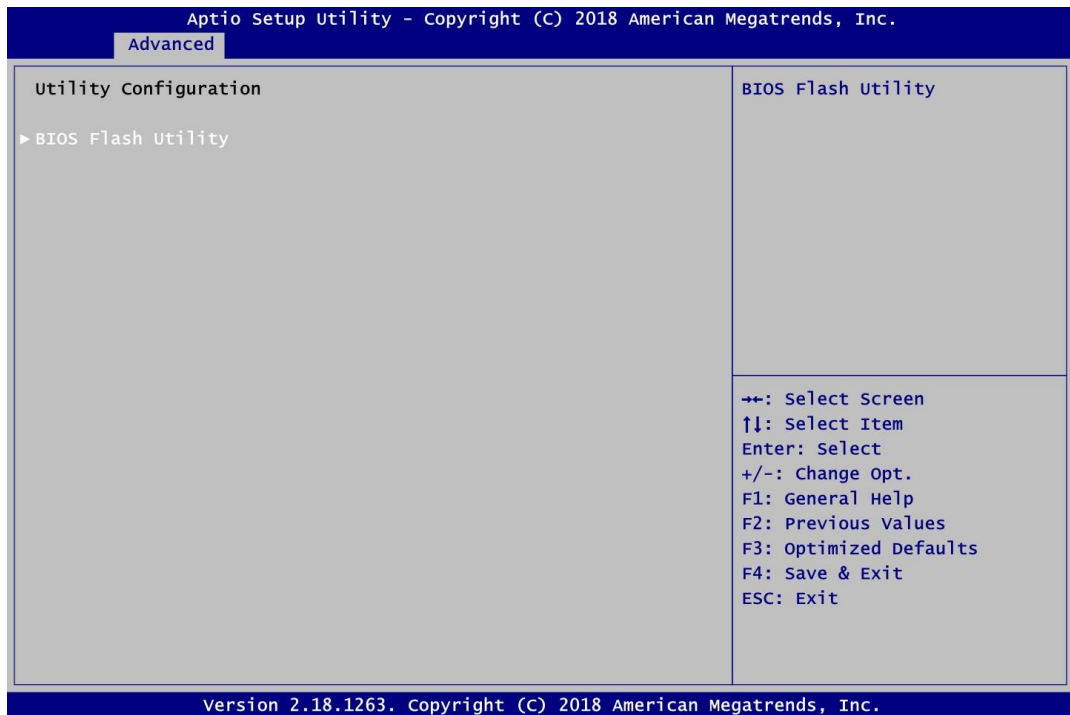
**USB Devices**

Display all detected USB devices.

**Mass Storage Devices**

Mass storage device emulation type. Auto option enumerates devices according to their media format. Optical drives are emulated as CDROM, drives with no media will be emulated according to a drive type.

- **Utility Configuration**



**BIOS Flash Utility**

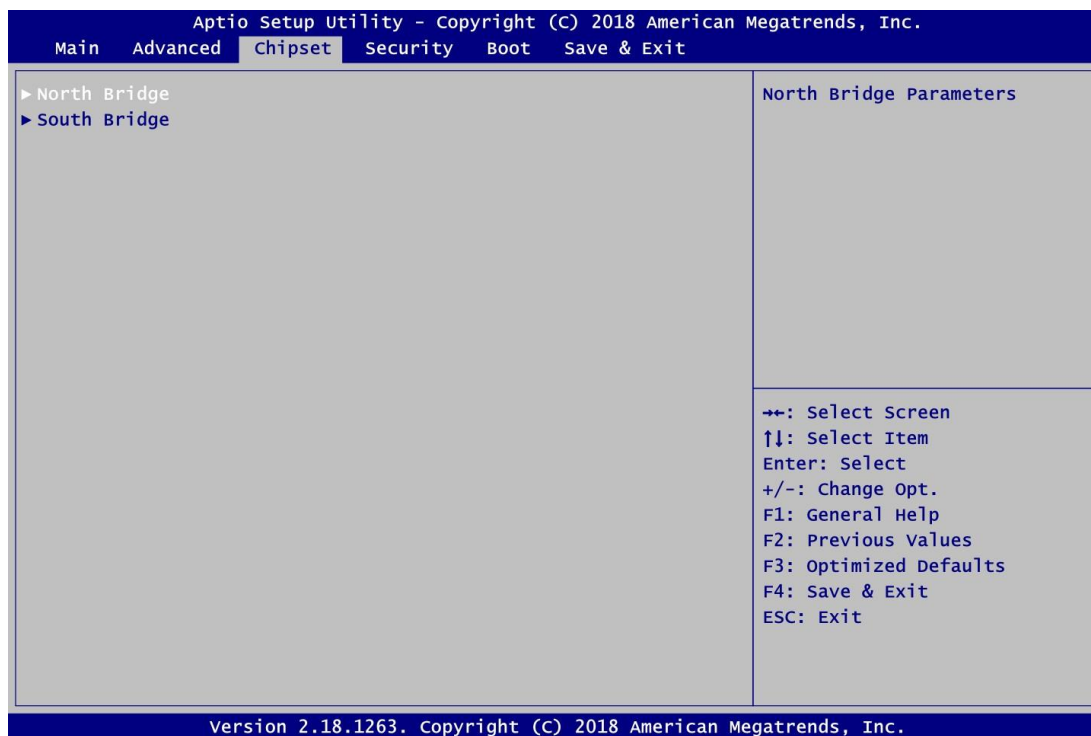
BIOS flash utility configuration. For more detailed information, please refer to Appendix B.

## 4.5 Chipset Menu

The Chipset menu allows users to change the advanced chipset settings. You can select any of the items in the left frame of the screen to go to the sub menus:

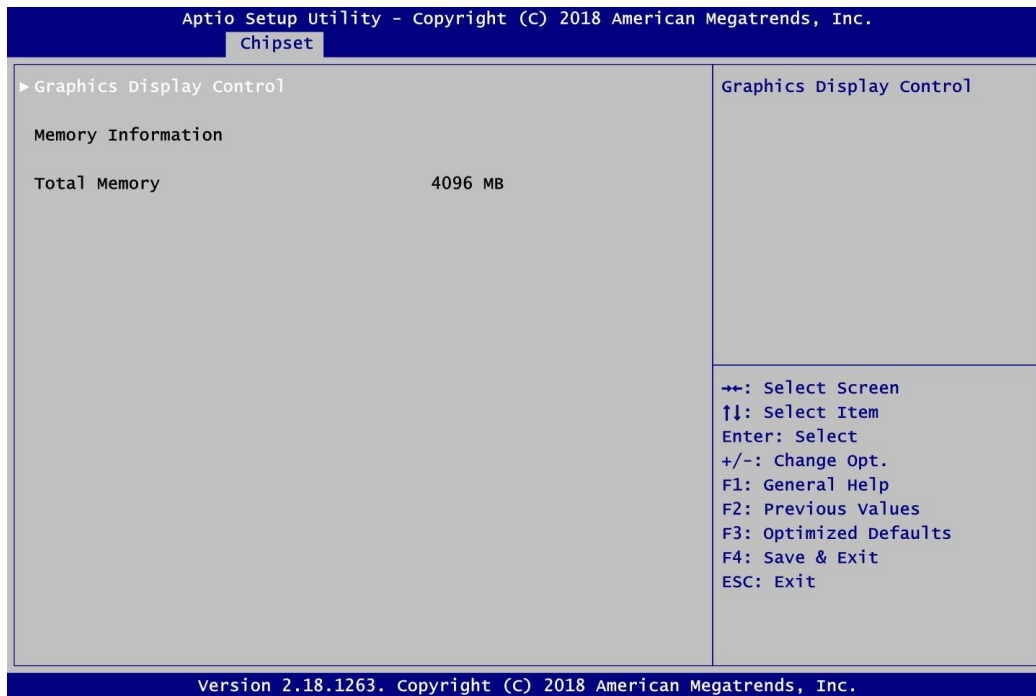
- ▶ North Bridge
- ▶ South Bridge

For items marked with "▶", please press <Enter> for more options.



- **North Bridge**

This screen allows users to configure parameters of North Bridge chipset.

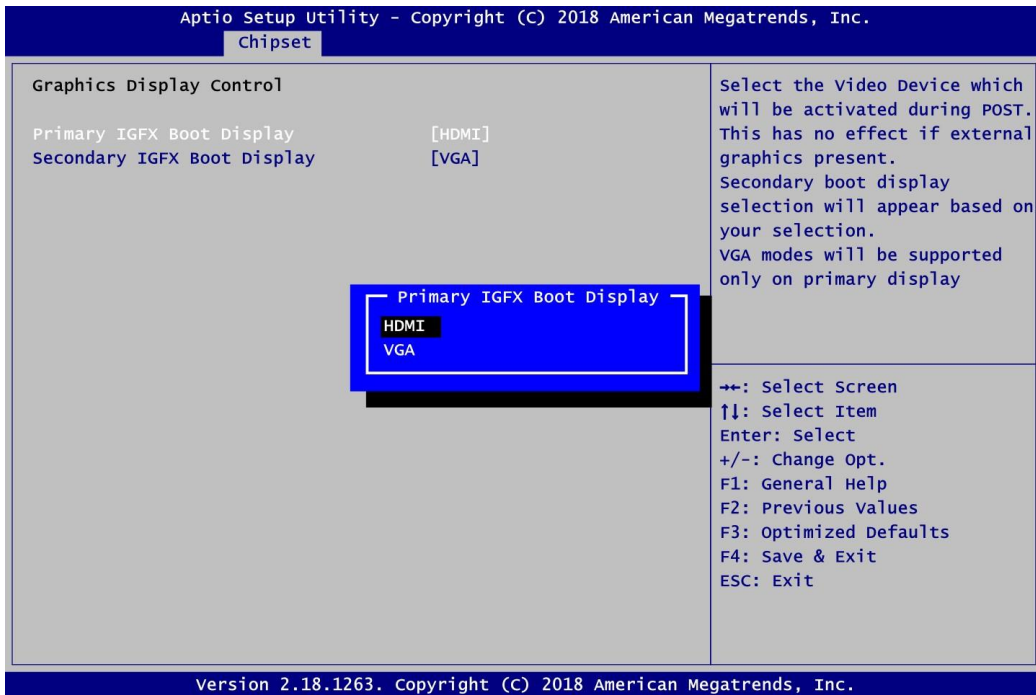


**Graphics Display Control**

This item allows you to select graphics display control options. Please press <Enter> to go to the sub menus.

**Memory Information**

Display system memory information.



**Primary IGFX Boot Display**

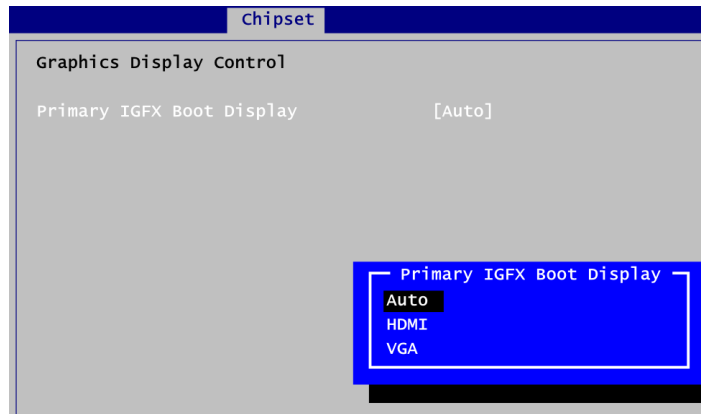
Select the video device which will be activated during POST (Power-On Self Test), the default will be HDMI when the Boot Mode is set to UEFI Mode (see section 4.7). Secondary boot display option will appear based on your selection.

**Secondary IGFX Boot Display**

Select secondary display device. Configuration options are HDMI and VGA.



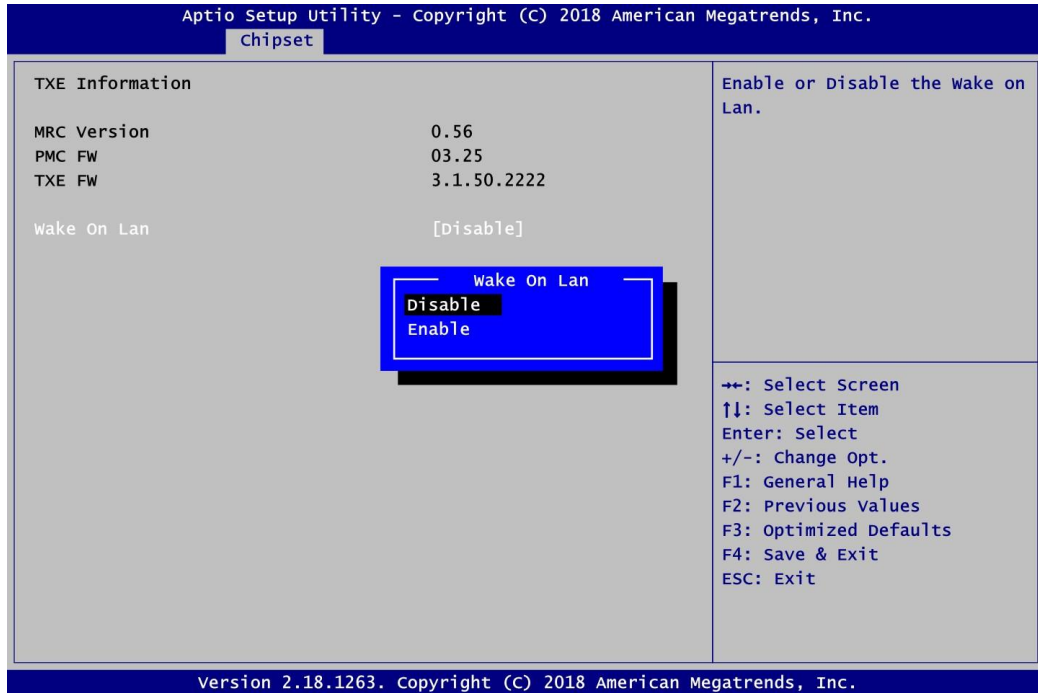
**Note**



*The default will be Auto when the Boot Mode is set to Legacy Mode, see section 4.7. Secondary boot display option will appear based on your selection.*

- **South Bridge**

This screen allows users to configure parameters of South Bridge chipset.

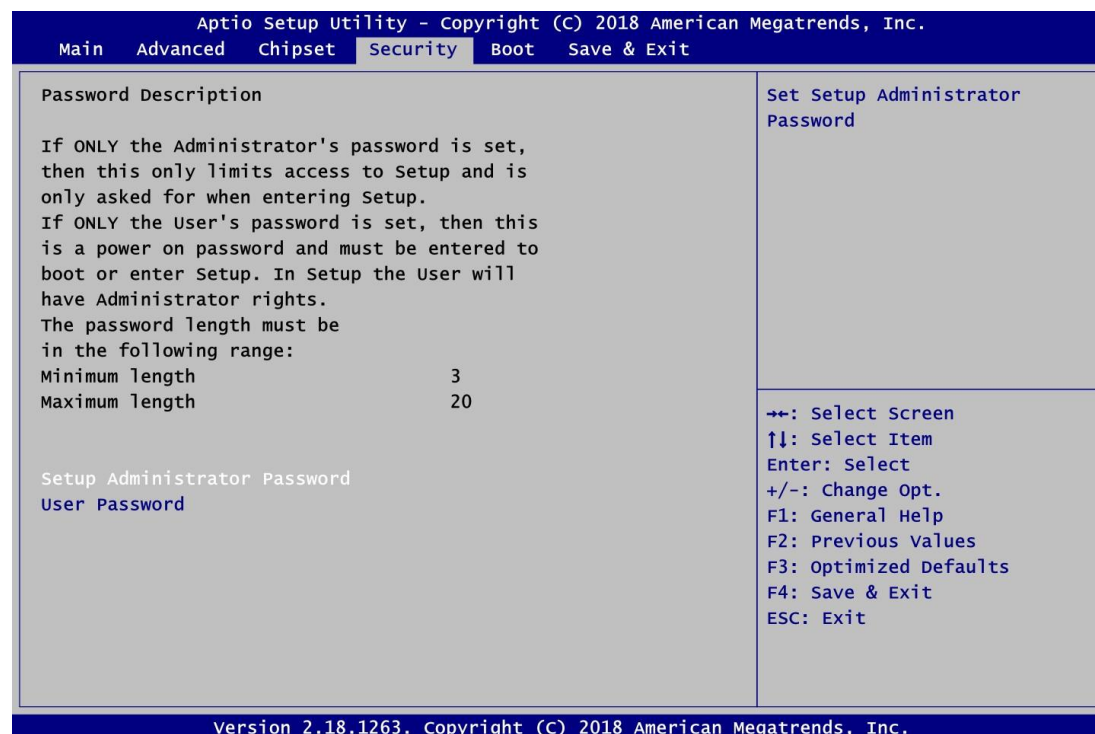


**Wake on LAN**

Enable or disable integrated LAN to wake the system.

## 4.6 Security Menu

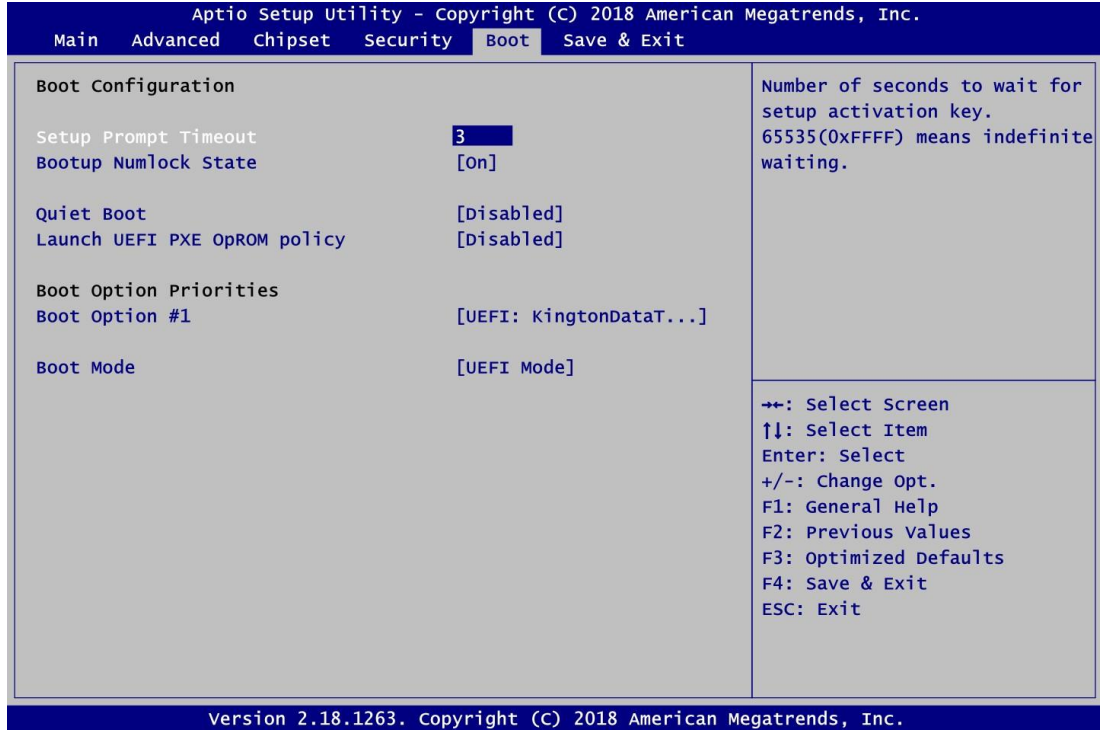
The Security menu allows users to change the security settings for the system.



- **Setup Administrator Password**  
Set setup administrator password.
- **User Password**  
Set user password.

## 4.7 Boot Menu

The Boot menu allows users to change boot options of the system.



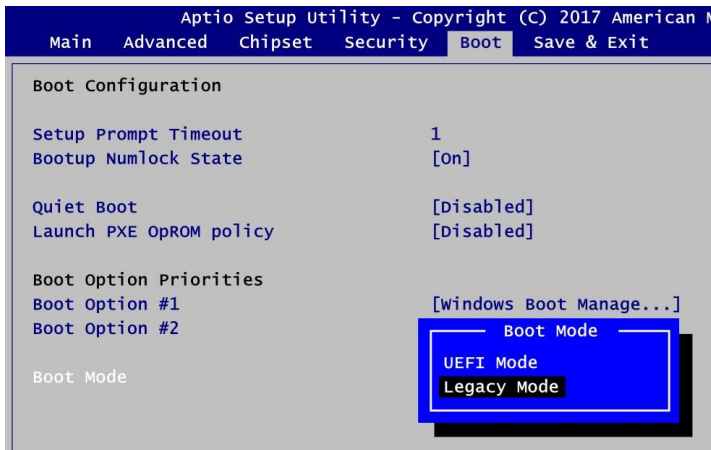
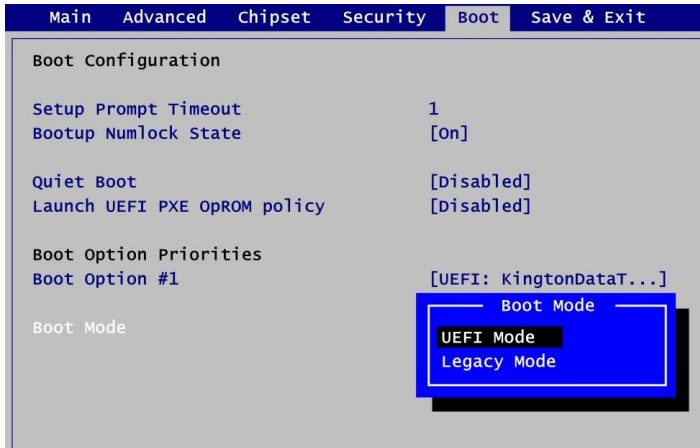
- Setup Prompt Timeout**  
 Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.
- Bootup NumLock State**  
 Use this item to select the power-on state for the keyboard NumLock.
- Quiet Boot**  
 Select to display either POST output messages or a splash screen during boot-up.
- Launch UEFI PXE OpROM policy**  
 Control the execution of UEFI PXE OpROM.
- Boot Option Priorities [Boot Option #1, ...]**  
 These are settings for boot priority. Specify the boot device priority sequence from the available devices.



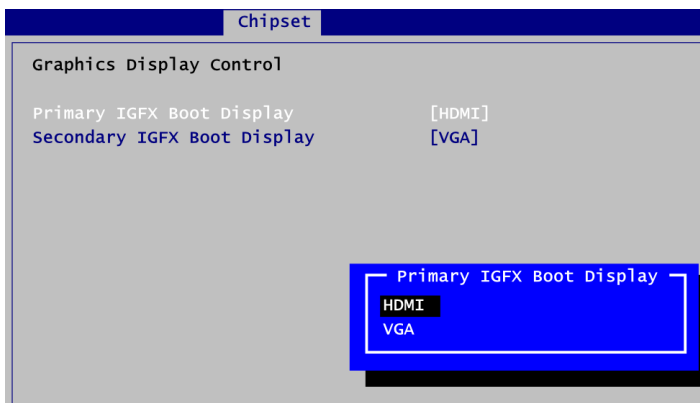
● **Boot Mode**

Use this option for boot mode settings.

- UEFI Boot: Select support to boot any UEFI-capable OS.
- Legacy Boot: Select support to boot non UEFI-capable OS that expects a legacy BIOS interface.

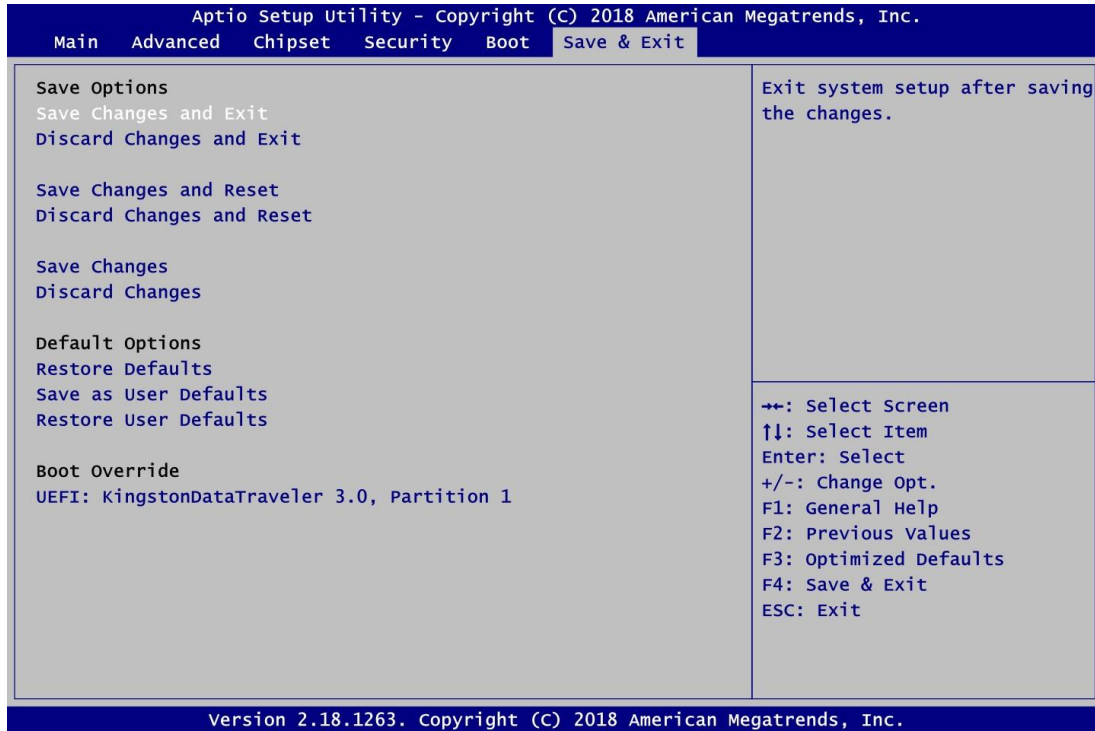


Note that the following Primary and Secondary IGFX Boot Display options appear only if Legacy Mode is selected, see images below.



## 4.8 Save & Exit Menu

The Save & Exit menu allows users to load your system configuration with optimal or fail-safe default values.



- Save Changes and Exit**  
When you have completed the system configuration changes, select this option to leave Setup and return to Main Menu. Select Save Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to save changes and exit.
- Discard Changes and Exit**  
Select this option to quit Setup without making any permanent changes to the system configuration and return to Main Menu. Select Discard Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to discard changes and exit.
- Save Changes and Reset**  
When you have completed the system configuration changes, select this option to leave Setup and reboot the computer so the new system configuration parameters can take effect. Select Save Changes and Reset from the Save & Exit menu and press <Enter>. Select Yes to save changes and reset.
- Discard Changes and Reset**  
Select this option to quit Setup without making any permanent changes to the system configuration and reboot the computer. Select Discard Changes and Reset from the Save & Exit menu and press <Enter>. Select Yes to discard changes and reset.
- Save Changes**  
When you have completed the system configuration changes, select this option to save changes. Select Save Changes from the Save & Exit menu and press <Enter>. Select Yes to save changes.

- **Discard Changes**  
Select this option to quit Setup without making any permanent changes to the system configuration. Select Discard Changes from the Save & Exit menu and press <Enter>. Select Yes to discard changes.
- **Restore Defaults**  
It automatically sets all Setup options to a complete set of default settings when you select this option. Select Restore Defaults from the Save & Exit menu and press <Enter>.
- **Save as User Defaults**  
Select this option to save system configuration changes done so far as User Defaults. Select Save as User Defaults from the Save & Exit menu and press <Enter>.
- **Restore User Defaults**  
It automatically sets all Setup options to a complete set of User Defaults when you select this option. Select Restore User Defaults from the Save & Exit menu and press <Enter>.
- **Boot Override**  
Select a drive to immediately boot that device regardless of the current boot order.

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# Appendix A

## Watchdog Timer

### A.1 About Watchdog Timer

Software stability is major issue in most application. Some embedded systems are not watched by human for 24 hours. It is usually too slow to wait for someone to reboot when computer hangs. The systems need to be able to reset automatically when things go wrong. The watchdog timer gives us solution.

The watchdog timer is a counter that triggers a system reset when it counts down to zero from a preset value. The software starts counter with an initial value and must reset it periodically. If the counter ever reaches zero which means the software has crashed, the system will reboot.

### A.2 Watchdog Timer Programming

```

*****
/**                                     **
/**      Copyright(C) 2018, Axiomtek co., Ltd      **
/**                                     **
/**      All Rights Reserved.                    **
/**                                     **
*****

#include <pc.h>
#include <stdio.h>

#define SIO_Index_Port          0x2E
#define SIO_Data_Port          0x2F
#define SIO_Enter_Configuration_Mode 0x01
#define SIO_Entry_key          0x55
#define SIO_LDN_SEL_REGISTER   0x07
#define SIO_LogicalDevice_GPIO 0x07
#define SIO_Offset_Countdown_Type 0x72
#define SIO_Offset_Countdown_Timer 0x73
#define SIO_Countdown_Type_Second 0xC0
#define SIO_Countdown_Type_Minute 0x40
#define SIO_Exit_Configuration_Mode 0x02

void main() {
    int CountdownType=0;
    int WDTtimer=0;

    printf("Input Watch Dog Timer type, 1:Second; 2:Minute :");
    scanf("%d",&CountdownType);

    printf("\nInput Timer to countdown:");
    scanf("%d",&WDTtimer);
    printf("Start to countdown...");

    //
    // Enter Configuration Mode
    //

```

```
    outportw(SIO_Index_Port,0x87);
    outportw(SIO_Index_Port,SIO_Enter_Configuration_Mode);
    outportw(SIO_Index_Port,SIO_Entry_key);
    outportw(SIO_Index_Port,SIO_Entry_key);

    //
    // Select Logical device : GPIO
    //
    outportw(SIO_Index_Port,SIO_LDN_SEL_REGISTER);
    outportw(SIO_Data_Port,SIO_LogicalDevice_GPIO);

    //
    // Select count type for minute type or second type to execute WDT timer
    // by below method.
    //
    outportw(SIO_Index_Port,SIO_Offset_Countdown_Type);
    if(CountdownType == 1)
    outportw(SIO_Data_Port,SIO_Countdown_Type_Second);
    else if(CountdownType == 2)
    outportw(SIO_Data_Port,SIO_Countdown_Type_Minute);

    //
    // Set WDT Timer
    //
    outportw(SIO_Index_Port,SIO_Offset_Countdown_Timer);
    outportw(SIO_Data_Port,WDTtimer);

    //
    // Exit Configuration Mode
    //
    outportw(SIO_Index_Port,SIO_Exit_Configuration_Mode);
    outportw(SIO_Index_Port,SIO_Exit_Configuration_Mode);
}
```

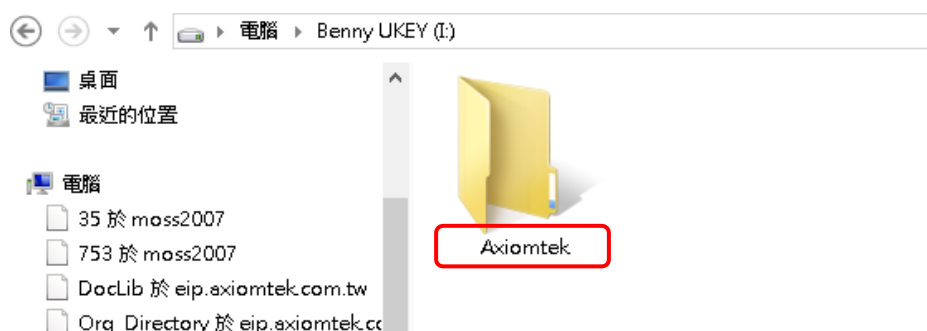


# Appendix B

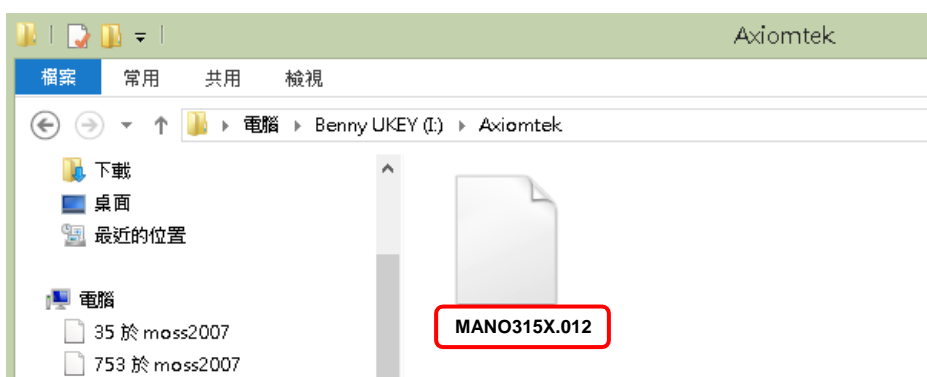
## BIOS Flash Utility

The BIOS Flash utility is a new helpful function in BIOS setup program. With this function you can easily update system BIOS without having to enter operating system. In this appendix you may learn how to do it in just a few steps. Please read and follow the instructions below carefully.

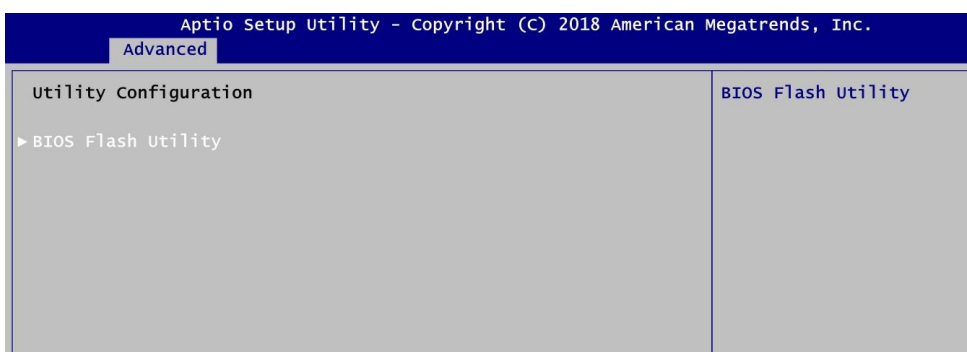
1. In your USB flash drive, create a new folder and name it “Axiomtek”, see figure below.



2. Copy BIOS ROM file (e.g. MANO315X.012) to “Axiomtek” folder.

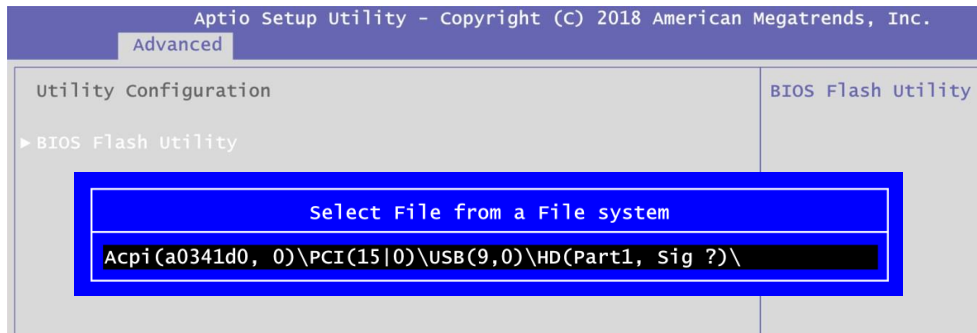


3. Insert the USB flash drive to your system.
4. Enter BIOS setup menu and go to Advanced\Utility Configuration. Select BIOS Flash Utility and press <Enter>.

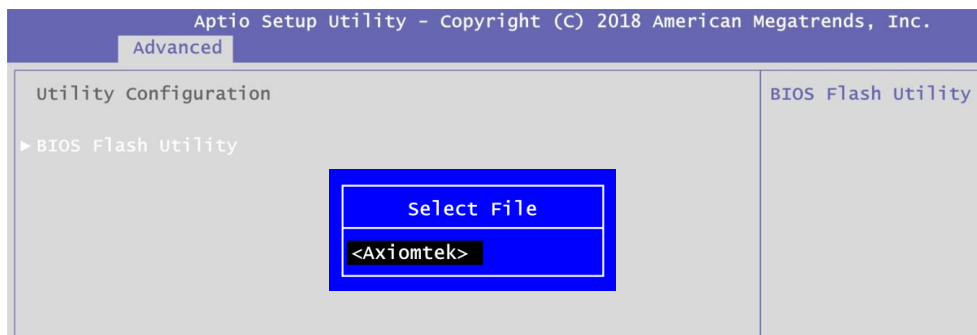




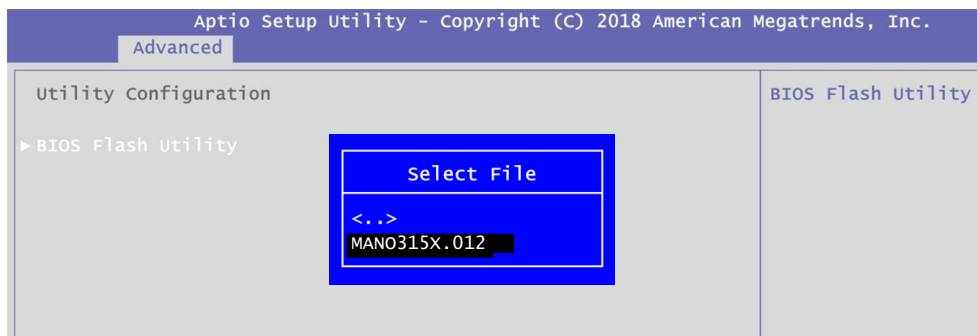
- BIOS automatically detect all USB drive(s) attached to the system. In this example only one USB drive is attached to the system. That's why, you can see only one device is displayed in figure below.



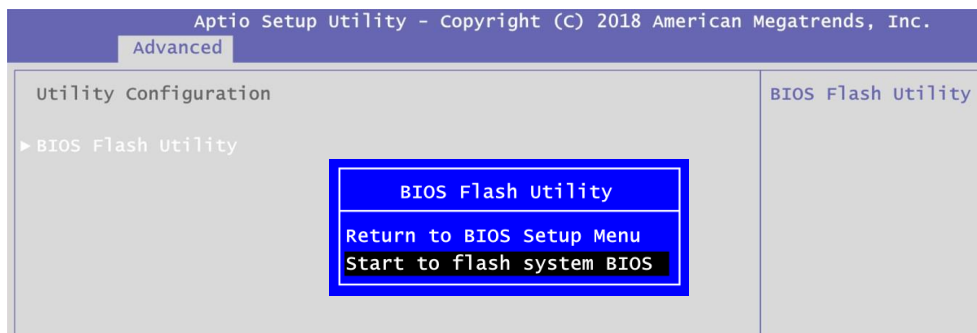
- Select the USB drive containing BIOS ROM file you want to update using the <↑> or <↓> key. Then press <Enter> to get into "Axiomtek" folder.



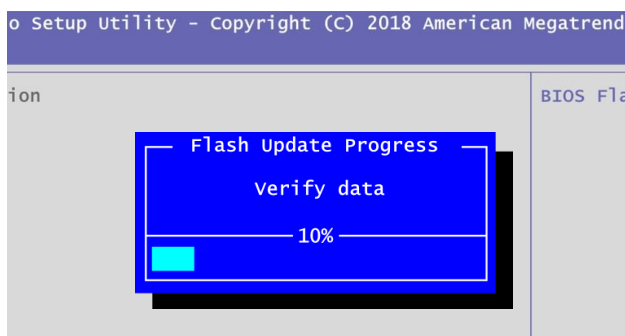
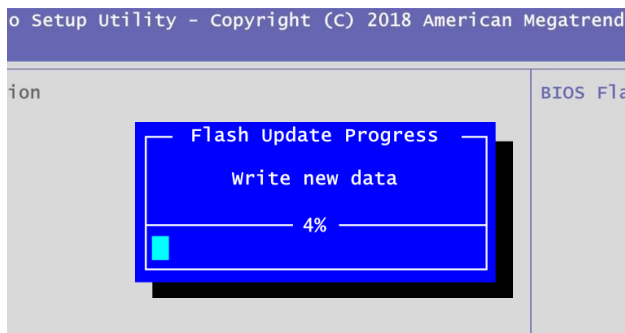
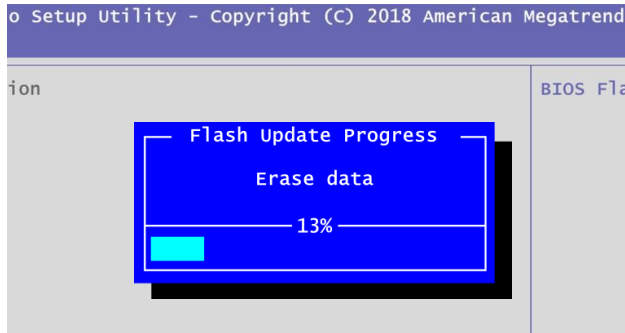
- Now you can see the BIOS ROM file on the screen, press <Enter> to select.



- Select Start to flash system BIOS option to begin updating procedure.



- Please wait while BIOS completes the entire flash update process: erase data, write new data and verify data.



- When you see the following figure, press <Enter> to finish the update process. After that the system will shut down and restart immediately.

