AXIOMTEK

MANO311 Series

Intel® Celeron® N3350 Processor
Mini ITX Motherboard

User's Manual

RoHS

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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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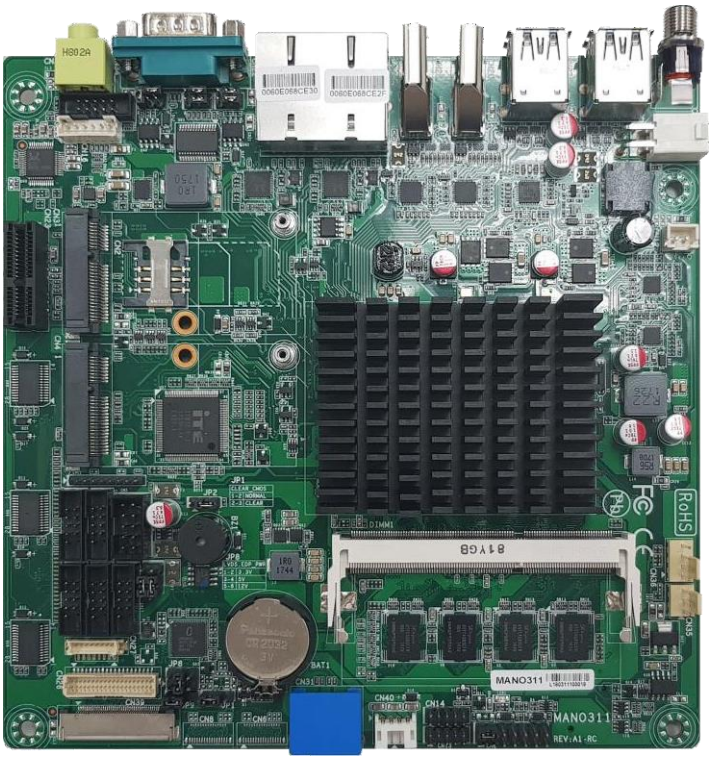
Chapter 1
Introduction



The MANO311 is a Mini ITX board based on Intel® Celeron® N3350 processor. It delivers outstanding system performance through high-bandwidth interfaces, multiple I/O functions for interactive applications and various embedded computing solutions. There is one 204-pin DDR3L SO-DIMM socket 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 N3350 (1.1~2.4GHz)
- 1 DDR3L 1866MHz memory with maximum capacity up to 8GB
- Onboard DDR3L 4GB and 1 DDR3L 1866MHz memory with maximum capacity up to 4GB (optional)
- 1 PCI-Express x1
- 1 PCI-Express Mini Card
- 1 SATA-600, 1 mSATA and 1 SDXC
- 4 USB 3.0 and 2 USB 2.0 ports
- 6 COM ports supported
- Display: Dual HDMI and LVDS

1.2 Specifications

- **CPU**
  - Intel® Celeron® dual core N3350 1.1GHz up to 2.4GHz.

- **Chipset**
  - SoC integrated.

- **BIOS**
  - AMI BIOS.

- **System Memory**
  - One 204-pin SO-DIMM socket.
  - Maximum up to 8GB DDR3L memory.
  - Support 1866MHz memory.

- **Onboard Multi I/O**
  - Controller: ITE8786E.
  - Six serial ports:
    - COM1 supports RS-232/422/485 (rear I/O).
    - COM2~COM6 support RS-232 only (internal).
  - 16-bit programmable Digital I/O.

- **USB Interface**
  - Four USB 3.0 ports (rear I/O).
  - Two USB 2.0 ports (internal).

- **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.
  - Line-out (rear I/O).
  - Line-in/Line-out/MIC-in (internal box header).

- **Display**
  - Two HDMI 1.4b with resolution max. up to 3840x2160 @ 30Hz or 2560x1600 @ 60Hz.
  - One 24-bit dual channel LVDS and one 8-pin inverter connector. LVDS resolution is max. up to 1920x1200.
  - One Embedded DisplayPort (eDP) with resolution max. up to 4096x2304 @60Hz; co-layout with LVDS connector (Optional).

- **Expansion Interface**
  - One PCI-Express x1 slot.
  - One PCI-Express Mini Card.
  - One mSATA.
  - One SIM card slot.

- **SSD**
  - One SDXC slot.

- **Power Input**
  - One 12V~24V 4-pin ATX power input connector.
  - One 12V/5A DC jack power input connector.

Note

Please plug either one of power input interfaces when power on.

- **Operating Temperature**
  - 0~60°C.

- **Storage Temperature**
  - -20~60°C.

- **Form Factor**
  - Mini ITX (6.7” x 6.7”, 17.0cm x 17.0cm).

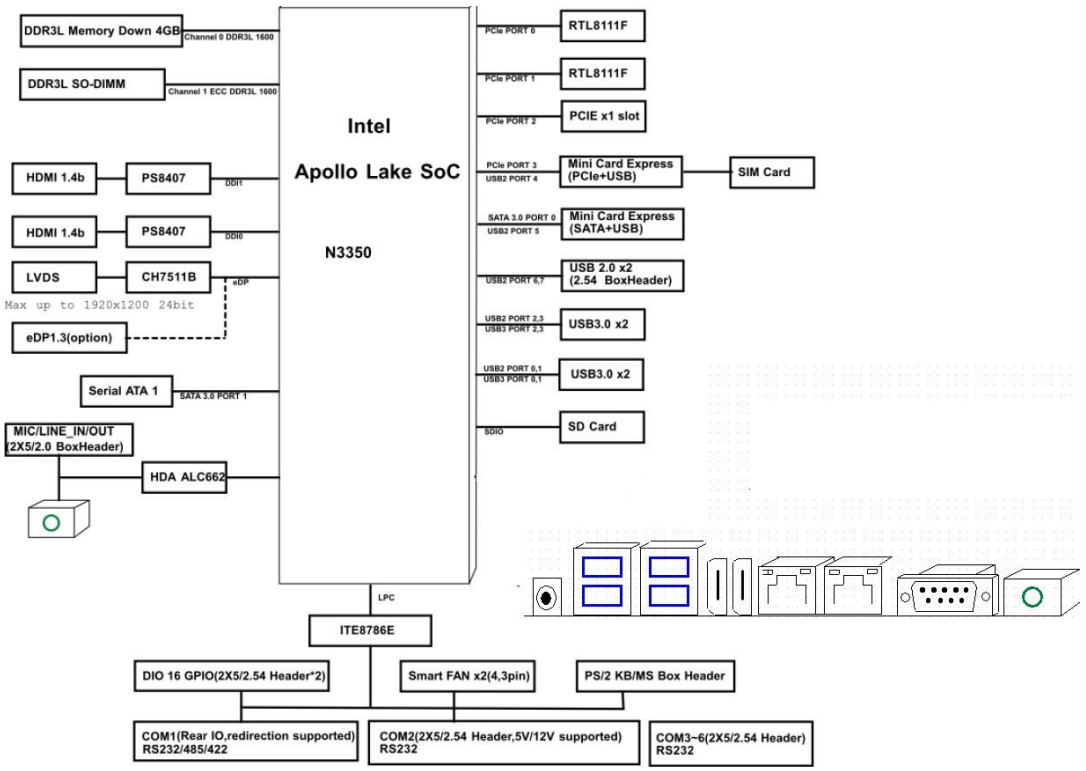
Note

All specifications and images are subject to change without notice.

1.3 Utilities Supported

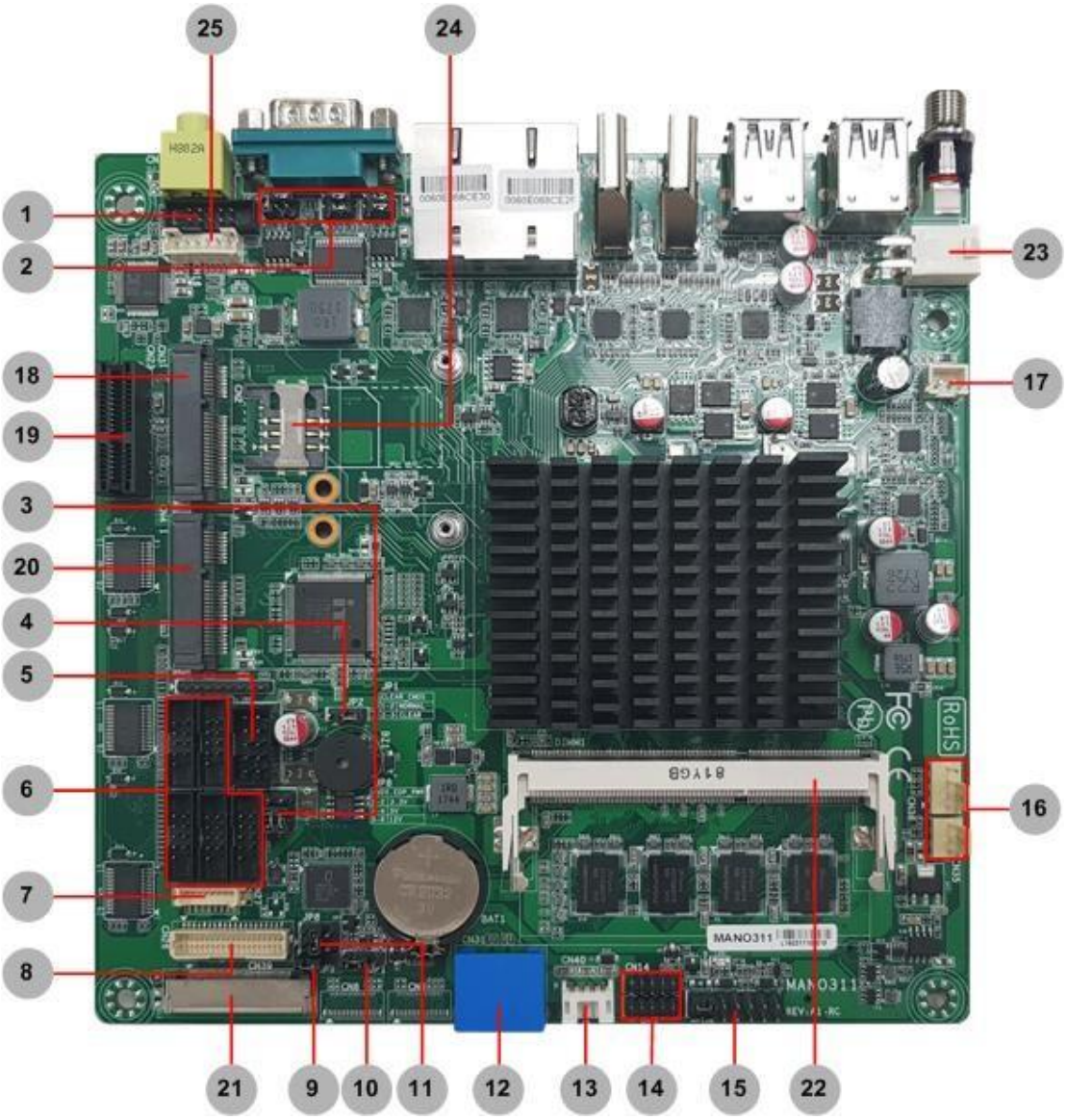
- Chipset driver
- Ethernet driver
- Graphics driver
- Audio driver
- Serial I/O driver
- Trusted Execution Engine

1.4 Block Diagram

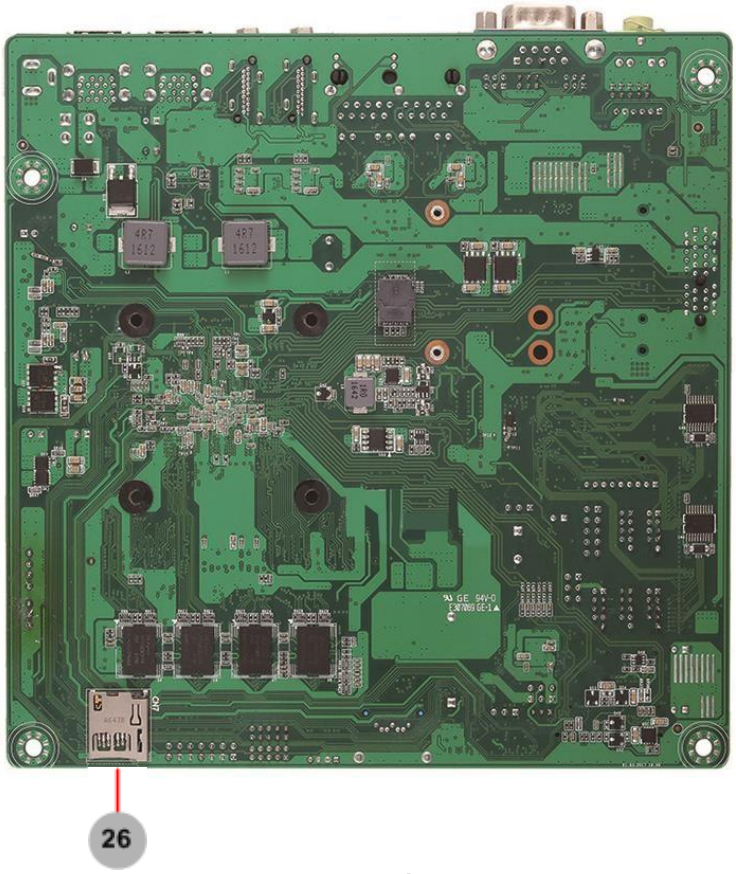


Chapter 2
Board and Pin Assignments

2.1 Board Layout

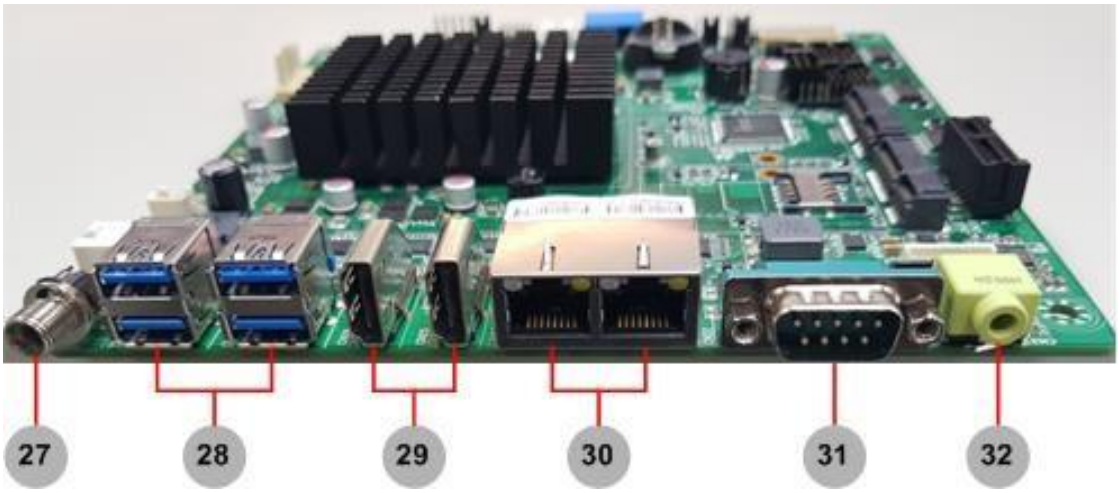


Top View



Bottom View

2.2 Rear I/O

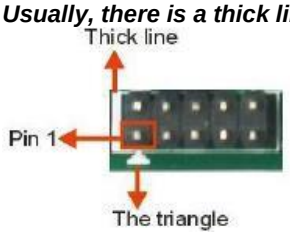


1	Front Audio Connector (CN24)	17	Power Status Connector (CN12)
2	COM1 RS-232/422/485 Mode Select Jumpers (JP3~JP5)	18	PCI-Express Mini Card Connector (CN3)
3	COM2 Data/Power Select Jumper (JP6)	19	PCI-Express x1 Slot (CN23)
4	AT/ATX Power Mode Select Jumper (JP2)	20	mSATA Connector (CN4)
5	Internal USB 2.0 Connector (CN5)	21	eDP Connector (CN39) (Optional)
6	Internal COM2~COM6 Connectors (CN17~CN21)	22	DDR3L SO-DIMM Connector (DIMM1)
7	LVDS Backlight Control Connector (CN27)	23	ATX Power Input Connector (CN10)
8	LVDS Connector (CN26)	24	SIM Card Socket (CN2)
9	LVDS Backlight PWM/CCFL Select Jumper (JP7)	25	Keyboard and Mouse Connector (CN16)
10	Clear CMOS Jumper (JP1)	26	Micro SD Card Slot (CN7)
11	LVDS VDD Select Jumper (JP8)	27	DC Jack Power Input Connector (CN9)
12	SATA 3.0 Connector (CN31)	28	USB 3.0 Ports (CN32~CN33)
13	SATA Power Connector (CN40)	29	HDMI Connectors (CN25, CN29)
14	Digital I/O Connectors (CN13~CN14)	30	Ethernet Ports (CN22, CN30)
15	Front Panel Connector (CN1)	31	COM1 D-Sub Connector (CN34)
16	CPU and System Fan Connectors (CN35~CN36)	32	Audio Jack (CN37)

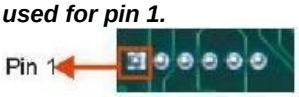
Note

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.***

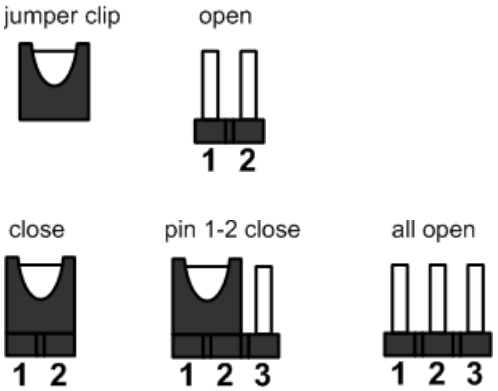


- ***Square pad, which you can find on the back of the motherboard, is usually used for pin 1.***



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 MANO311 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
JP3	COM1 RS-232/422/485 Mode Select Default: RS-232		1-2 Close
JP4			3-5, 4-6 Close
JP5			3-5, 4-6 Close
JP6	COM2 Data/Power Select Default: RS-232 Data	COM2 Pin 1: DCD#	3-5 Close
		COM2 Pin 8: RI#	4-6 Close
JP7	LVDS Backlight PWM/CCFL Select Default: PWM		1-2 Close
JP8	LVDS VDD Select Default: +3.3V		1-2 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)

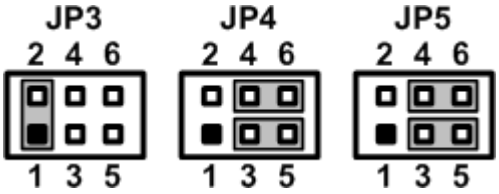
This 3-pin (pitch=2.54mm) jumper allows you to select AT or ATX power mode.

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

2.3.3 COM1 RS-232/422/485 Mode Select (JP3, JP4, JP5)

Use these jumpers (3x2-pin pitch=2.54mm) to set COM1 port to operate as RS-232, RS-422 or RS-485 communication mode.

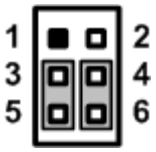
Function	Setting
RS-232 mode (Default)	JP3 1-2 close JP4 3-5, 4-6 close JP5 3-5, 4-6 close
RS-422 mode	JP3 3-4 close JP4 1-3, 2-4 close JP5 1-3, 2-4 close
RS-485 mode	JP3 5-6 close JP4 1-3, 2-4 close JP5 1-3, 2-4 close



2.3.4 COM2 Data/Power Select (JP6)

This is a 3x2-pin (pitch=2.54mm) jumper. The COM2 port has +5V power capability on DCD and +12V on RI by setting JP6.

Function	Setting
Power: Set COM2 pin 1 to +5V	1-3 close
Data: Set COM2 pin 1 to DCD (Default)	3-5 close
Power: Set COM2 pin 8 to +12V	2-4 close
Data: Set COM2 pin 8 to RI (Default)	4-6 close



2.3.5 LVDS Backlight PWM/CCFL Select (JP7)

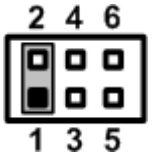
This 3-pin (pitch=2.54mm) jumper enables you to select PWM or voltage control mode for LVDS backlight control connector (CN27). These two control modes are for adjusting the brightness of LVDS panel.

Function	Setting
Controlled by PWM (Default)	1-2 close
Controlled by DC Voltage	2-3 close

2.3.6 LVDS VDD Select (JP8)

This motherboard supports voltage selection for flat panel displays. Use this 3x2-pin (pitch=2.54mm) jumper to set up VDD power of the LVDS connector. To prevent hardware damage, before connecting please make sure that the input voltage of LVDS panel is correct.

Function	Setting
+3.3V (Default)	1-2 close
+5V	3-4 close
+12V	5-6 close



2.4 Connectors

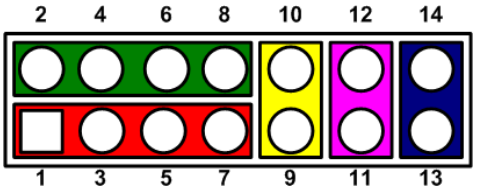
Signals go to other parts of the system through connectors. Loose or improper connection might cause problems, please make sure all connectors are properly and firmly connected. Here is a summary table showing connectors on the hardware.

Connector	Description
CN1	Front Panel Connector
CN2	SIM Card Socket
CN3	PCI-Express Mini Card Connector
CN4	mSATA Connector
CN5	Internal USB 2.0 Connector
CN7	Micro SD Card Slot
CN9	DC Jack Power Input Connector
CN10	ATX Power Input Connector
CN12	Power Status Connector
CN13~CN14	Digital I/O Connectors
CN16	Keyboard and Mouse Connector
CN17~CN21	Internal COM2~COM6 Connectors
CN22, CN30	Ethernet Port 1 and 2
CN23	PCI-Express x1 Slot
CN24	Front Audio Connector
CN25, CN29	HDMI Connectors
CN26	LVDS Connector
CN27	LVDS Backlight Control Connector
CN31	SATA 3.0 Connector
CN32~CN33	USB 3.0 Ports
CN34	COM1 D-Sub Connector
CN35~CN36	CPU and System Fan Connectors
CN37	Audio Jack
CN39 (Optional)	eDP Connector
CN40	SATA Power Connector
DIMM1	DDR3L SO-DIMM Connector

2.4.1 Front Panel Connector (CN1)

This is a 2x7-pin (pitch=2.54mm) connector for front panel interface.

Pin	Signal
1	Power LED+
2	SPK-
3	GND
4	BUZZER
5	Power LED-
6	N/C
7	N/C
8	SPK+
9	PWR-
10	PWR+
11	RESET-
12	RESET+
13	HD LED-
14	HD LED+



Power LED

Pin 1 connects anode(+) of LED and pin 5 connects cathode(-) of LED. The power LED lights up when the system is powered on.

External Speaker and Internal Buzzer

Pin 2, 4, 6 and 8 connect the case-mounted speaker unit or internal buzzer. While connecting the board to an internal buzzer, please set pin 2 and 4 closed; while connecting to an external speaker, you need to set pins 2 and 4 opened and connect the speaker cable to pin 8(+) and pin 2(-).

Power On/Off Button

Pin 9 and 10 connect the power button on front panel to the board, which allows users to turn on or off power supply.

System Reset Switch

Pin 11 and 12 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.

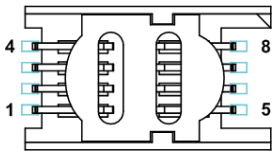
HDD Activity LED

This connection is linked to hard drive activity LED on the control panel. LED flashes when HDD is being accessed. Pin 13 and 14 connect the hard disk drive to the front panel HDD LED, pin 13 is assigned as cathode(-) and pin 14 is assigned as anode(+).

2.4.2 SIM Card Socket (CN2)

The motherboard has CN2 socket for inserting SIM Card. In order to work properly, the SIM Card must be used together with 3G module which is inserted to CN3. It is mainly used in 3G wireless network application.

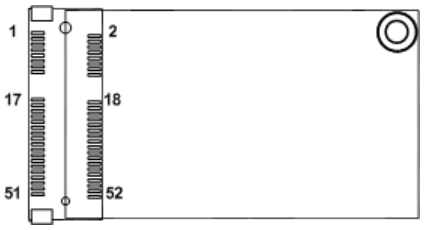
Pin	Signal
1	PWR
2	RST
3	CLK
4	NC
5	GND
6	VPP
7	I/O
8	NC



2.4.3 PCI-Express Mini Card Connector (CN3)

This is a PCI-Express Mini Card connector applying to PCI-Express or USB 2.0. It also complies with PCI-Express Mini Card Spec. V1.2.

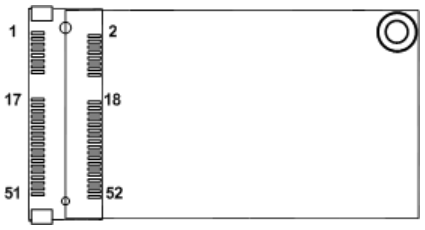
Pin	Signal	Pin	Signal
1	WAKE#	2	+3.3VAUX
3	RSVD1	4	GND
5	RSVD2	6	+1.5V
7	CLKREQ#	8	UIM_PWR
9	GND	10	UIM_DAT
11	REFCLK-	12	UIM_CLK
13	REFCLK+	14	UIM_REST
15	GND	16	UIM_VPP
17	RSVD3	18	GND
19	RSVD4	20	W_DISABLE#
21	GND	22	PERST#
23	PERN0	24	+3.3VAUX
25	PERP0	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PETN0	32	SMB_DATA
33	PETP0	34	GND
35	GND	36	USB_D-
37	GND	38	USB_D+
39	+3.3VAUX	40	GND
41	+3.3VAUX	42	N/C
43	GND	44	N/C
45	RVD5	46	N/C
47	RVD6	48	+1.5V
49	RVD7	50	GND
51	RVD8	52	+3.3VAUX



2.4.4 mSATA Connector (CN4)

The mSATA interface is available through connector CN4.

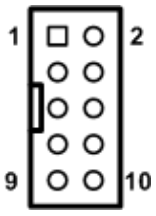
Pin	Signal	Pin	Signal
1	WAKE#	2	+3.3VAUX
3	RSVD1	4	GND
5	RSVD2	6	+1.5V
7	CLKREQ#	8	UIM_PWR
9	GND	10	UIM_DAT
11	REFCLK-	12	UIM_CLK
13	REFCLK+	14	UIM_REST
15	GND	16	UIM_VPP
17	RSVD3	18	GND
19	RSVD4	20	W_DISABLE#
21	GND	22	PERST#
23	PERN0	24	+3.3VAUX
25	PERP0	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PETN0	32	SMB_DATA
33	PETP0	34	GND
35	GND	36	USB_D-
37	GND	38	USB_D+
39	+3.3VAUX	40	GND
41	+3.3VAUX	42	N/C
43	GND	44	N/C
45	RVD5	46	N/C
47	RVD6	48	+1.5V
49	RVD7	50	GND
51	RVD8	52	+3.3VAUX



2.4.5 Internal USB 2.0 Connector (CN5)

This is a 5x2-pin (pitch=2.54mm) connector for USB 2.0 interface.

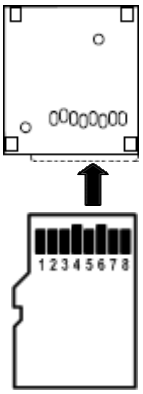
Pin	Signal	Pin	Signal
1	+5V	2	+5V
3	USB1-	4	USB2-
5	USB1+	6	USB2+
7	GND	8	GND
9	N/C	10	N/C



2.4.6 Micro SD Card Slot (CN7)

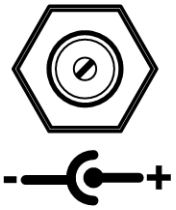
The CN7 is a small expansion slot located at the bottom side for inserting micro Secure Digital (SD) card, a removable flash memory card used for information storage.

Pin	Signal
1	DAT2
2	DAT3
3	CMD
4	+3.3V
5	CLK
6	GND
7	DAT0
8	DAT1



2.4.7 DC Jack Power Input Connector (CN9)

The CN9 is a DC jack with screw. Firmly insert at least 60W adapter into this connector. Loose connection may cause system instability and make sure all components/devices are properly installed before connecting.



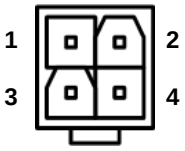
Note

The screw thread size is 5/16-32 (inch screw threads).

2.4.8 ATX Power Input Connector (CN10)

This is a 4-pin ATX connector for DC +12V~24V power input. External power supply plug fits into this connector 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
1	GND
2	GND
3	DC IN
4	DC IN



2.4.9 Power Status Connector (CN12)

This is a 2-pin (pitch=2.54mm) connector. It lets user know the power state (PSON) of this motherboard.

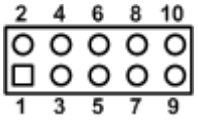
Pin	Signal
1	PWR+
2	PWR-

2.4.10 Digital I/O Connectors (CN13~CN14)

The motherboard comes with two 2x5-pin (pitch=2.0mm) connectors for digital I/O interfaces.

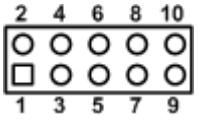
Pin	Signal	Pin	Signal
1	+5V	2	SIO_GPI70 (0xA06, Bit0, L)[*]
3	SIO_GPO74 (0xA06, Bit4, L)[*]	4	SIO_GPI71 (0xA06, Bit1, L)[*]
5	SIO_GPO75 (0xA06, Bit5, L)[*]	6	SIO_GPI72 (0xA06, Bit2, L)[*]
7	SIO_GPO76 (0xA06, Bit6, L)[*]	8	SIO_GPI73 (0xA06, Bit3, L)[*]
9	SIO_GPO77 (0xA06, Bit7, L)[*]	10	GND

CN13



Pin	Signal	Pin	Signal
1	+5V	2	SIO_GPI87 (0xA07, Bit0, L)[*]
3	SIO_GPO83 (0xA07, Bit4, L)[*]	4	SIO_GPI86 (0xA07, Bit1, L)[*]
5	SIO_GPO82 (0xA07, Bit5, L)[*]	6	SIO_GPI85 (0xA07, Bit2, L)[*]
7	SIO_GPO81 (0xA07, Bit6, L)[*]	8	SIO_GPI84 (0xA07, Bit3, L)[*]
9	SIO_GPO80 (0xA07, Bit7, L)[*]	10	GND

CN14



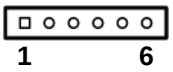
Note

[*]: "H" or "L" means the default voltage is High or Low level, and GPIO output is 5V.

2.4.11 Keyboard and Mouse Connector (CN16)

This is a 6-pin (pitch=2.0mm) connector for keyboard and mouse interface.

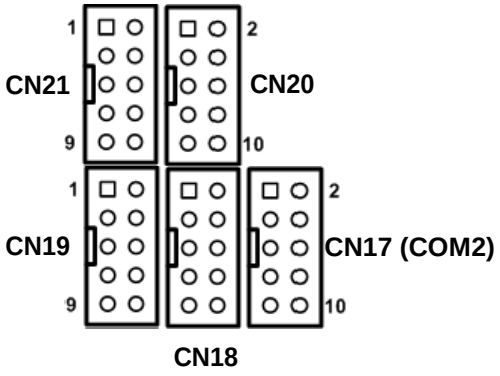
Pin	Signal	Pin	Signal
1	KB_CLK	2	KB_DATA
3	MS_CLK	4	GND
5	+5V	6	MS_DATA



2.4.12 Internal COM Connectors (CN17~CN21)

The motherboard has five 5x2-pin (pitch=2.0mm) connectors for COM2~COM6 port interfaces. Only COM2 comes with power capability on DCD and RI pins by setting JP6, see section 2.3.4.

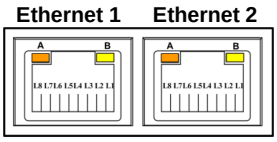
Pin	Signal	Pin	Signal
1	DCD#	2	DSR#
3	RXD	4	RTS#
5	TXD	6	CTS#
7	DTR#	8	RI#
9	GND	10	N/C



2.4.13 Ethernet Ports (CN22 and CN30)

The motherboard comes with two high performance plug and play Ethernet interfaces (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.

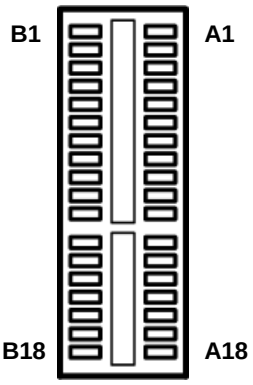
Pin	1000 Base-T	100/10 Base-T	Description
L1	BI_DA+	TX+	Bidirectional or Transmit Data+
L2	BI_DA-	TX-	Bidirectional or Transmit Data-
L3	BI_DB+	RX+	Bidirectional or Receive Data+
L4	BI_DC+	N.C.	Bidirectional or Not Connected
L5	BI_DC-	N.C.	Bidirectional or Not Connected
L6	BI_DB-	RX-	Bidirectional or Receive Data-
L7	BI_DD+	N.C.	Bidirectional or Not Connected
L8	BI_DD-	N.C.	Bidirectional or Not Connected
A	Speed LED 1000: Orange 100/10: Green/OFF		
B	Active Link LED (Yellow) Off: No link Blinking: Data activity detected		



2.4.14 PCI-Express x1 Slot (CN23)

This motherboard has one PCI-Express x1 slot.

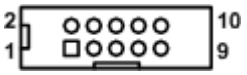
Pin	Signal	Pin	Signal
B1	+12V	A1	PRSNT1#
B2	+12V	A2	+12V
B3	RSVD	A3	+12V
B4	GND	A4	GND
B5	SMCLK	A5	NC
B6	SMDAT	A6	NC
B7	GND	A7	NC
B8	+3.3V	A8	NC
B9	NC	A9	+3.3V
B10	3.3Vaux	A10	+3.3V
B11	WAKE#	A11	PERST#
B12	NC	A12	GND
B13	GND	A13	REFCLK+
B14	HSOP0	A14	REFCLK-
B15	HSON0	A15	GND
B16	GND	A16	HSIP0
B17	NC	A17	HSIN0
B18	GND	A18	GND



2.4.15 Front Audio Connector (CN24)

This is a 2x5-pin (pitch=2.0mm) front audio connector for convenient connection and control of audio devices.

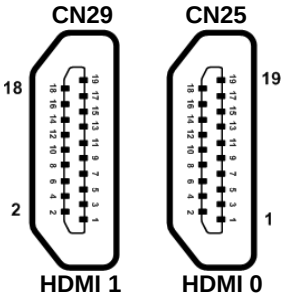
Pin	Signal	Pin	Signal
1	MIC_IN	2	GND
3	LINE_IN_L	4	GND
5	LINE_IN_R	6	GND
7	AUD_OUT_L	8	GND
9	AUD_OUT_R	10	GND



2.4.16 HDMI Connector (CN25 and CN29)

The motherboard comes with two HDMI connectors. 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		



2.4.17 LVDS Connector (CN26)

This is a 2x20-pin (pitch=1.0mm) connector which is compliant with JST SM40B-SRDS-G-TF for LVDS LCD interface. It is strongly recommended to connect it with matching connector, SHDR-40VS-B. Pin 1~6 VDD can be set to +3.3V or +5V or +12V by setting JP8, see section 2.3.6.

Pin	Signal	Pin	Signal
1	VDD	2	VDD
3	VDD	4	VDD
5	VDD	6	VDD
7	N/C	8	N/C
9	GND(Detect)[*]	10	GND
11	LVDS_B_DATA3-	12	LVDS_B_DATA0-
13	LVDS_B_DATA3+	14	LVDS_B_DATA0+
15	GND	16	GND
17	LVDS_B_CLK-	18	LVDS_B_DATA1-
19	LVDS_B_ CLK +	20	LVDS_B_DATA1+
21	GND	22	GND
23	LVDS_A_DATA0-	24	LVDS_B_DATA2-
25	LVDS_A_DATA0+	26	LVDS_B_DATA2+
27	GND	28	GND
29	LVDS_A_DATA1-	30	LVDS_A_DATA3-
31	LVDS_A_DATA1+	32	LVDS_A_DATA3+
33	LVDS_PRSNT#	34	GND
35	LVDS_A_DATA2-	36	LVDS_A_CLK-
37	LVDS_A_DATA2+	38	LVDS_A_ CLK +
39	GND(Detect)[*]	40	GND

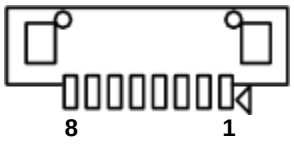
Note

[*] : Grounding of this pin is required to ensure normal LVDS output.

2.4.18 LVDS Backlight Control Connector (CN27)

This is an 8-pin (pitch=1.25mm) connector which is compliant with Hirose DF13-8P-1.25V for inverter. We strongly recommend you to use the matching connector, DF13-8S-1.25C, to avoid malfunction. The LVDS backlight control mode signal at pin 8 is selectable by jumper JP7, see section 2.3.5.

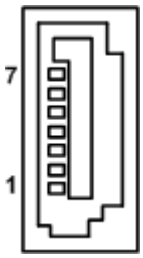
Pin	Signal
1	+12V
2	+12V
3	+5V
4	LVDS_BKL_EN
5	GND
6	GND
7	GND
8	LVDS_BKL_CTL



2.4.19 SATA 3.0 Connector (CN31)

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.

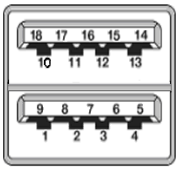
Pin	Signal
1	GND
2	SATA_TX+
3	SATA_TX-
4	GND
5	SATA_RX-
6	SATA_RX+
7	GND



2.4.20 USB 3.0 Ports (CN32~CN33)

The Universal Serial Bus (compliant with USB 3.0) connectors on the rear I/O are for installing USB peripherals such as keyboard, mouse, scanner, etc.

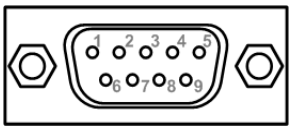
Pin	Signal	Pin	Signal
1	USB_PWR	10	USB_PWR
2	USB #0_D-	11	USB #1_D-
3	USB #0_D+	12	USB #1_D+
4	GND	13	GND
5	SSRX0-	14	SSRX1-
6	SSRX0+	15	SSRX1+
7	GND	16	GND
8	SSTX0-	17	SSTX1-
9	SSTX0+	18	SSTX1+



2.4.21 COM1 D-Sub Connector (CN34)

The CN34 is a standard 9-pin D-Sub connector for COM1 interface. The default setting is RS-232. However, it is selectable for RS-232/422/485 mode by setting jumper JP3, JP4 and JP5, see section 2.3.3. The pin assignments of RS-232/422/485 are listed in table below.

Pin	RS-232	RS-422	RS-485
1	DCD#	TX-	485-
2	RXD	TX+	485+
3	TXD	RX+	N/C
4	DTR#	RX-	N/C
5	GND	GND	GND
6	DSR#	N/C	N/C
7	RTS#	N/C	N/C
8	CTS#	N/C	N/C
9	RI#	N/C	N/C



2.4.22 Fan Connectors (CN35~CN36)

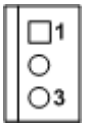
This motherboard has two fan connectors. You can find fan speed option(s) at BIOS Setup Utility. For further information, see BIOS Setup Utility: Advanced\HW Monitor\PC Health Status.

The CN35 (4-pin pitch=2.54mm) is for CPU fan interface.

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

The CN36 (3-pin pitch=2.54mm) is for system fan interface.

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



2.4.23 Audio Jack (CN37)

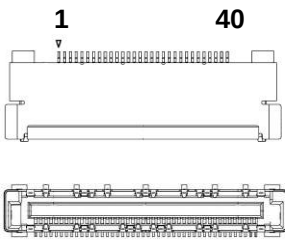
The motherboard provides HD audio jack on the rear I/O. Install audio driver, and then attach audio devices to CN37.

Pin Color	Signal
Green	Line-out

2.4.24 eDP Connector (CN39) (Optional)

The embedded DisplayPort (eDP) interface is available through 40-pin connector (CN39), which is compliant with I-PEX-CABLINE II HT1 20143. The eDP is a design to replace internal digital LVDS links in computer monitor panels and TV panels.

Pin	Signal	Pin	Signal
1	VDD[*]	2	VDD[*]
3	VDD[*]	4	VDD[*]
5	N/C	6	GND
7	GND	8	GND
9	GND	10	EMB_HPD
11	GND	12	EDP_TXN3C
13	EDP_TXP3_C	14	GND
15	EDP_TXN2_C	16	EDP_TXP2_C
17	GND	18	EDP_TXN1_C
19	EDP_TXP1_C	20	GND
21	EDP_TXN0_C	22	EDP_TXP0_C
23	GND	24	EMB_AUXP
25	EMB_AUXN	26	GND
27	VSS_EDP_AMOLED	28	VSS_EDP_AMOLED
29	VSS_EDP_AMOLED	30	VSS_EDP_AMOLED
31	N/C	32	EDP_BKLTCTL
33	EDP_BKLTEN	34	N/C
35	N/C	36	VCC_EDP_BKLT
37	VCC_EDP_BKLT	38	VCC_EDP_BKLT
39	VCC_EDP_BKLT	40	N/C



Note

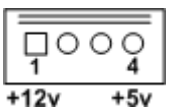
- ***CN39 is co-layout with LVDS connector (CN26); they can't be accessed simultaneously.***

[*]: Panel power VDD is +3.3V by default, +5V or 12V is selectable by jumper JP8, see section 2.3.6.

2.4.25 SATA Power Connector (CN40)

This is a 4-pin (pitch=2.0mm) connector for interfacing to SATA 2.5" and SATA 3.5" HDD power supply.

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



Chapter 3
Hardware Description

3.1 Microprocessors

The MANO311 supports Intel® Celeron® N3350 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 MANO311 uses AMI Plug and Play BIOS with a single SPI Flash.

3.3 System Memory

The MANO311 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.

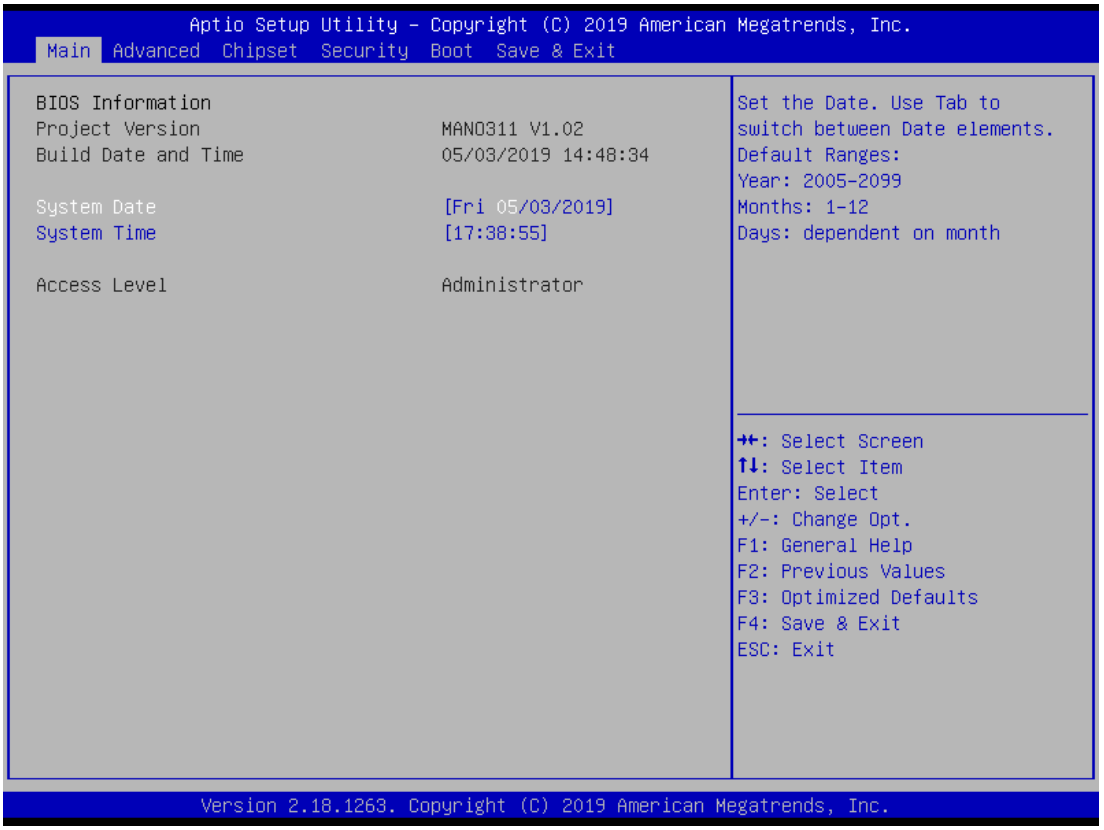
Note

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.

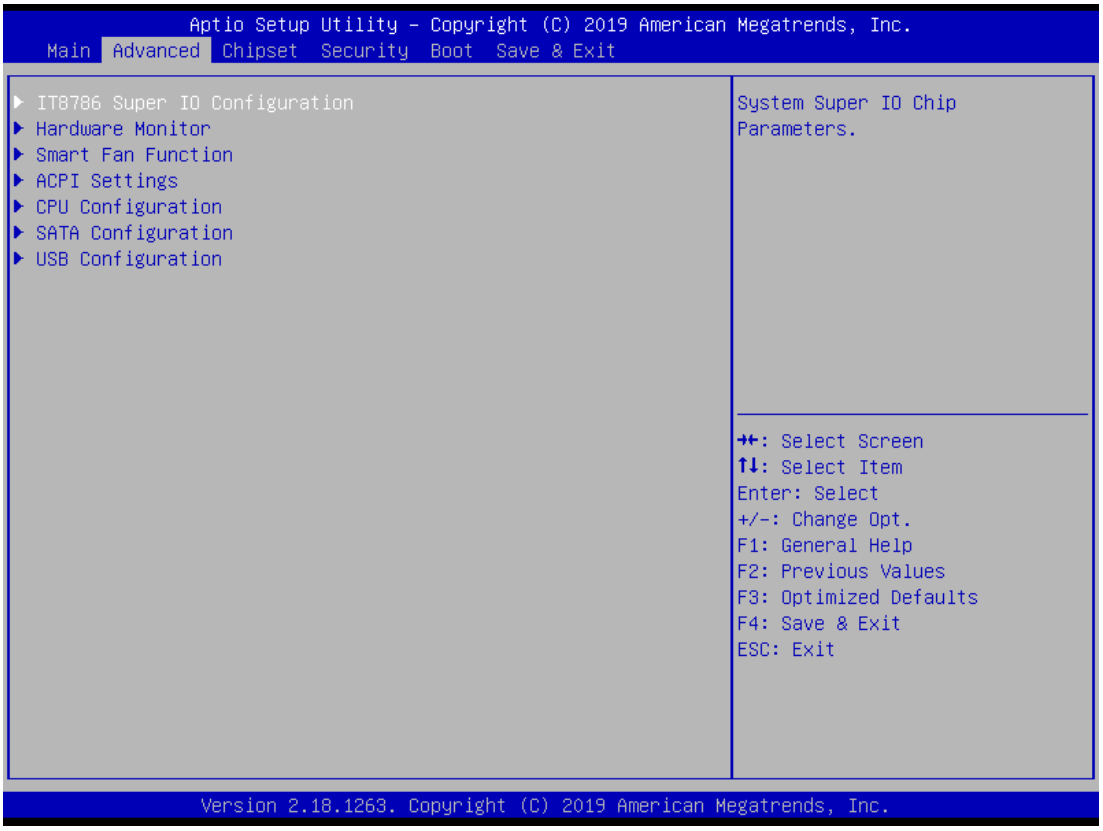
Access Level
Display the access level of current user.

4.4 Advanced Menu

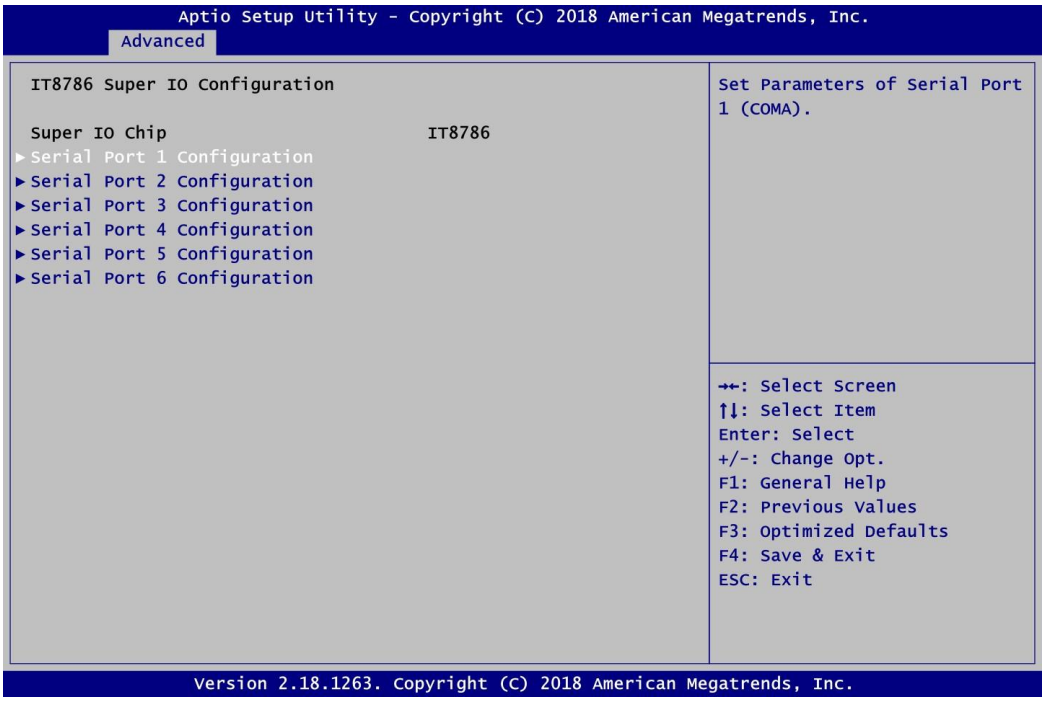
The Advanced menu also allows users to set configuration of the CPU and other system devices. You can select any of the items in the left frame of the screen to go to the sub menus:

- ▶ IT8786 Super IO Configuration
- ▶ Hardware Monitor
- ▶ Smart Fan Function
- ▶ ACPI Settings
- ▶ CPU Configuration
- ▶ SATA Configuration
- ▶ USB Configuration

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

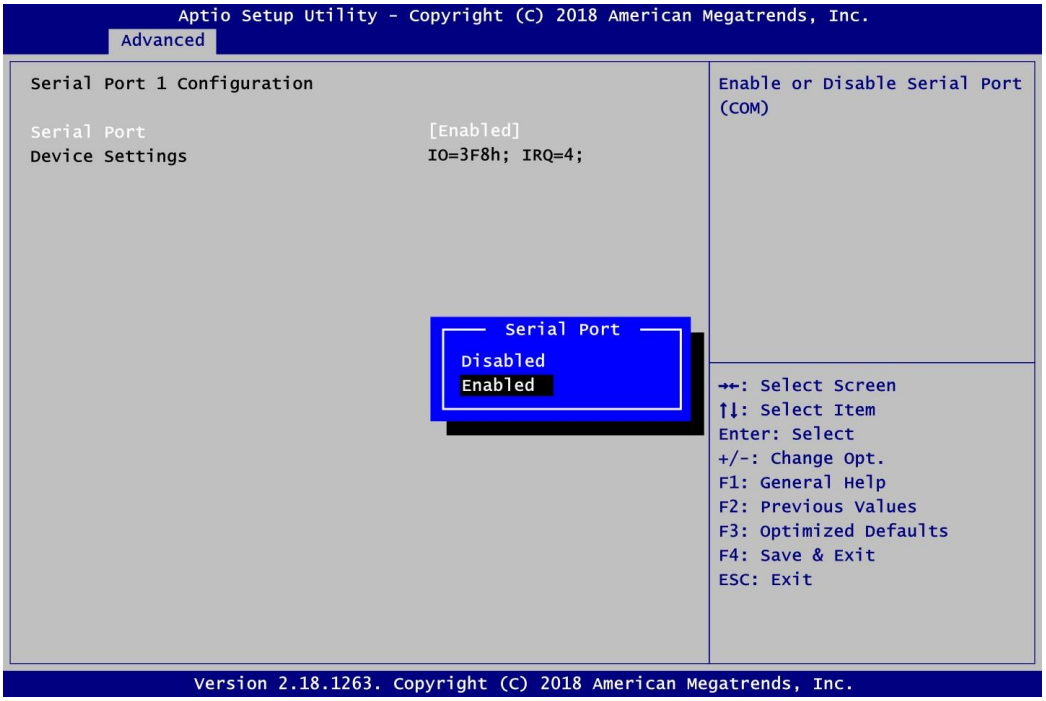


- **Super IO Configuration**
  You can use this screen to select options for the Super IO Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen. For items marked with "▶", please press <Enter> for more options.



Serial Port 1~6 Configuration
Use these items to set parameters related to serial port 1~6.

- **Serial Port 1~6 Configuration**

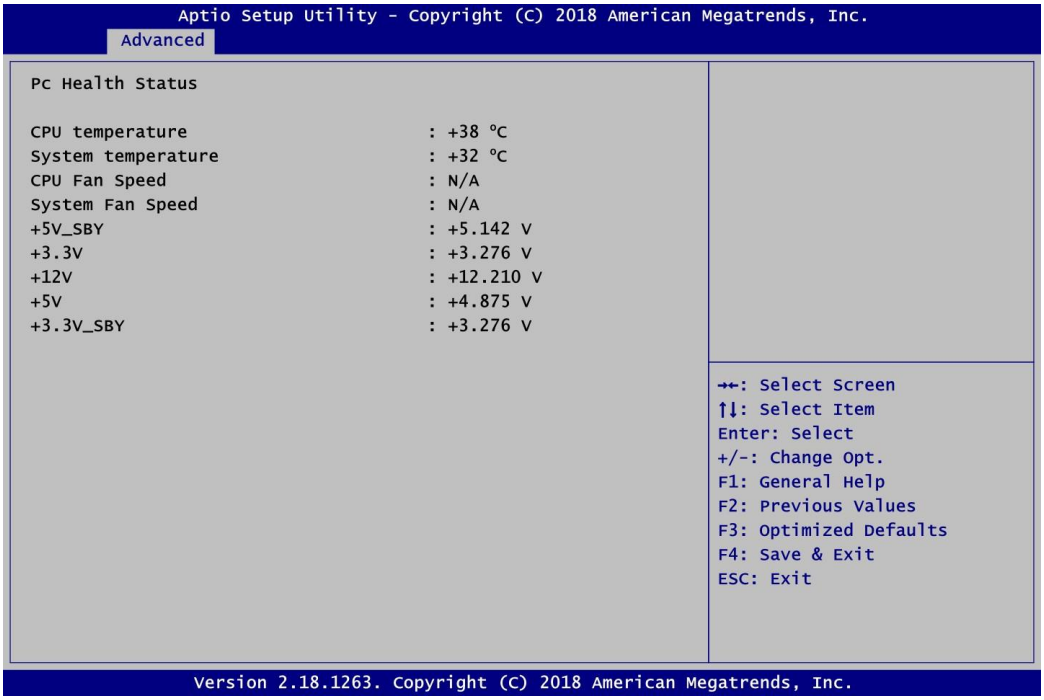


Serial Port

Enable or disable serial port 1~6. The optimal settings for base I/O address and for interrupt request address are:

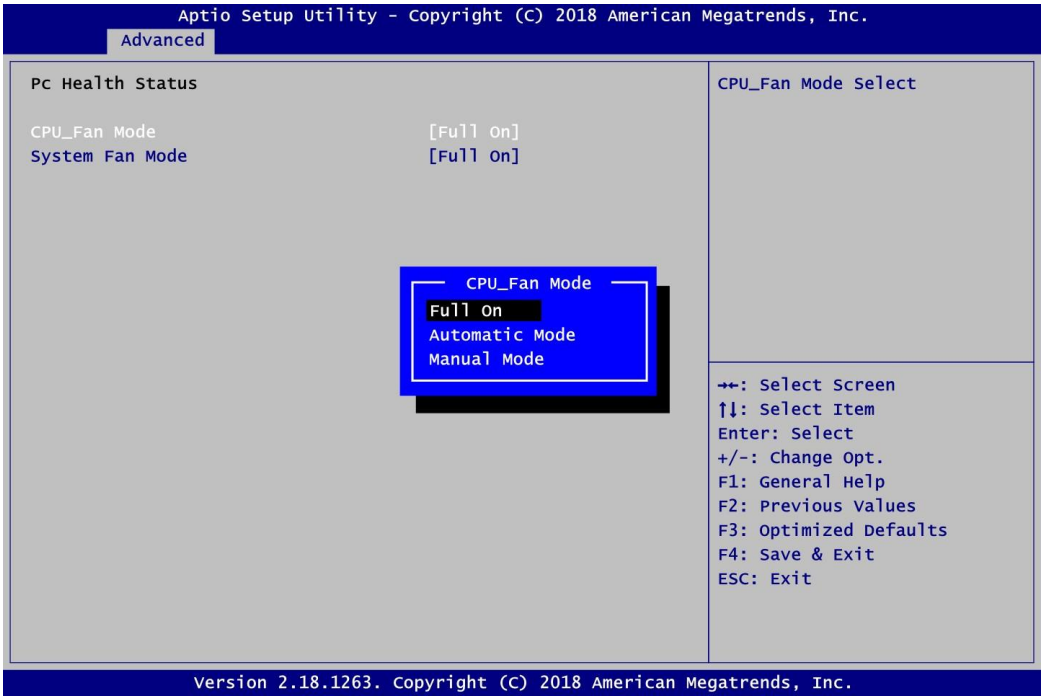
- Serial port 1: 3F8h, IRQ4
- Serial port 2: 2F8h, IRQ5
- Serial port 3: 3E8h, IRQ6
- Serial port 4: 2E8h, IRQ7
- Serial port 5: 2F0h, IRQ10
- Serial port 6: 2E0h, IRQ11

- **Hardware Monitor**
  This screen monitors hardware health status.



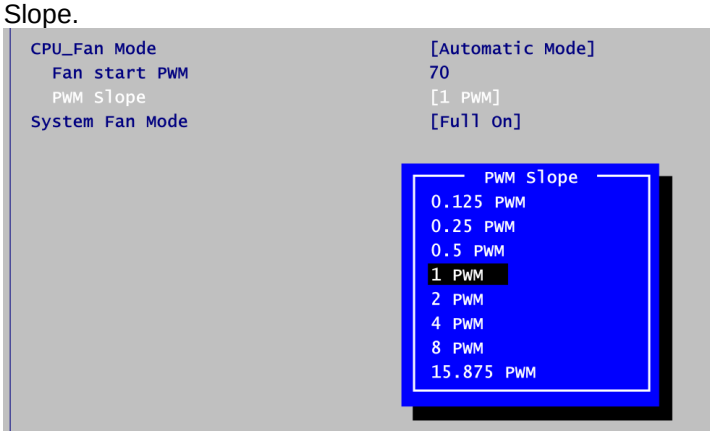
This screen displays the temperature of system and CPU, cooling fans speed in RPM and system voltages (+5V standby, +3.3V, +12V, +5V, and +3.3V standby).

- **Smart Fan Function**
  This screen allows you to select CPU fan and system fan mode.



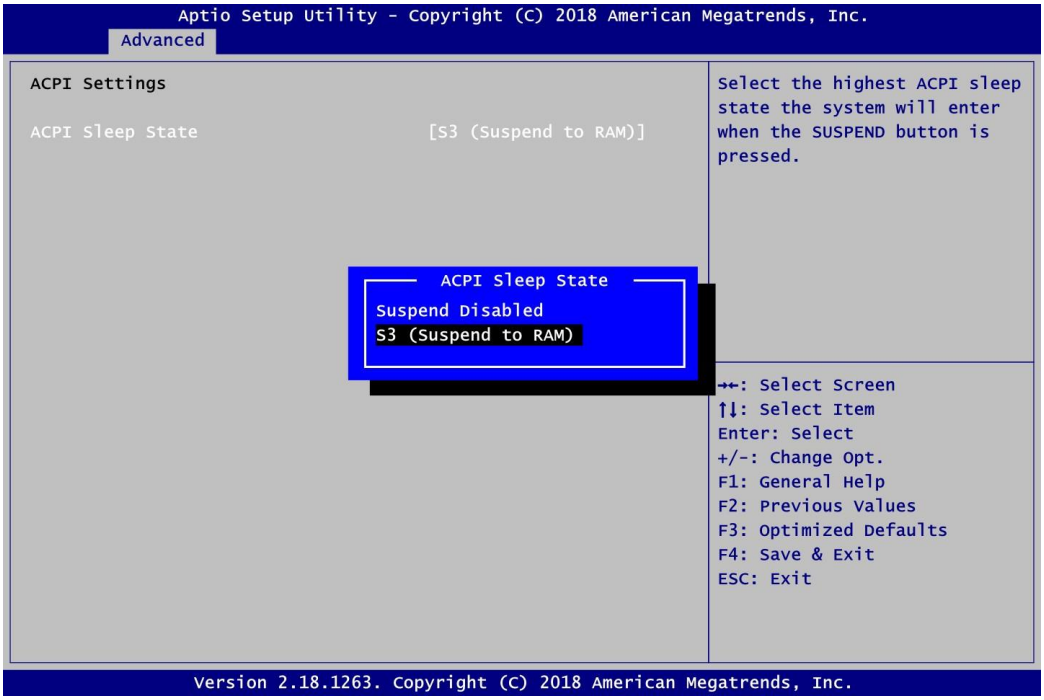
CPU_Fan\System Fan Mode
This item allows you to select CPU fan\System fan mode: Full On, Automatic Mode or Manual Mode.

- 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.



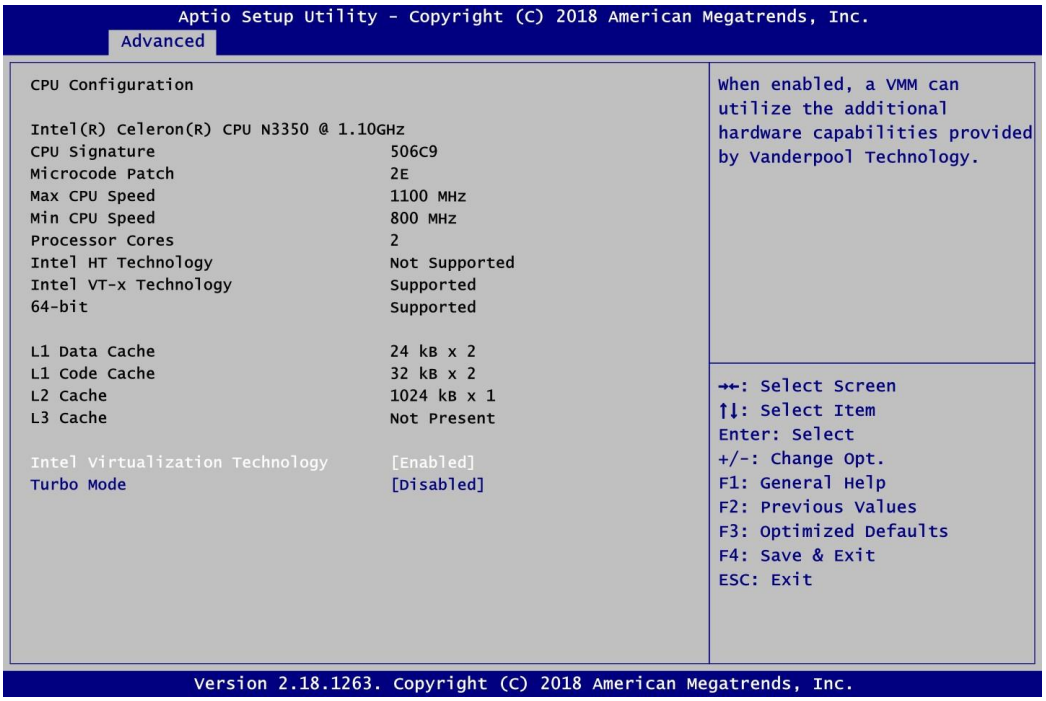
- Manual Mode: Use the start PWM value to set fan speed manually. The range is from 0 to 255.

- **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.

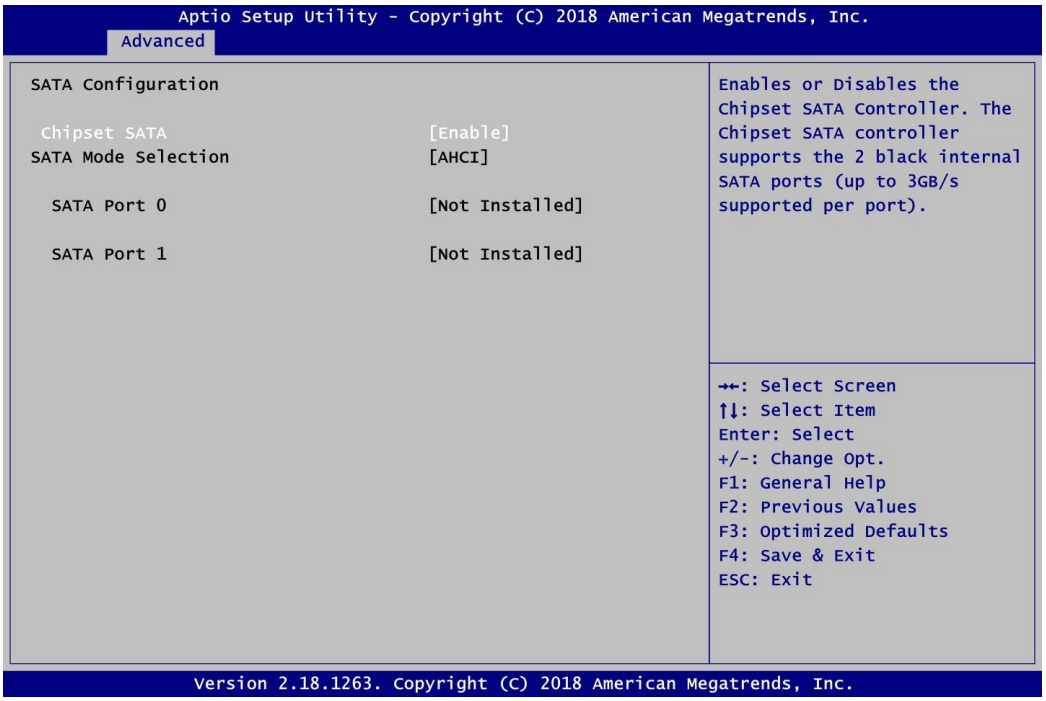
- **CPU Configuration**
  This screen shows the CPU information, and you can change the value of the selected option.



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 turbo mode.

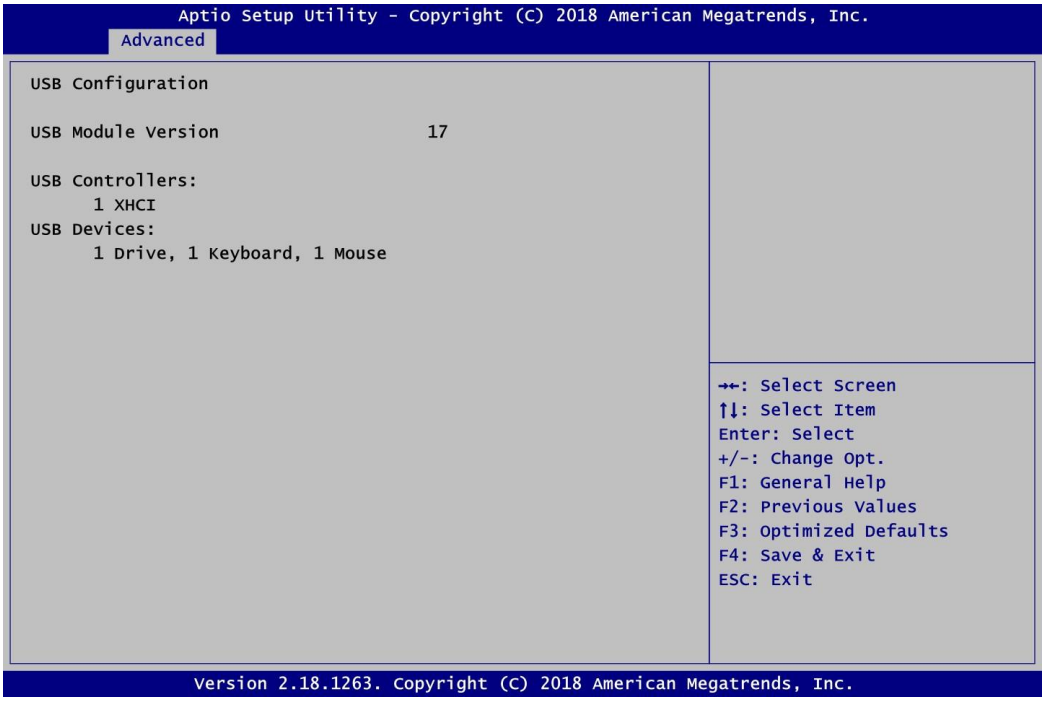
- **SATA Configuration**
  During system boot up, BIOS automatically detects the presence of SATA devices. In SATA Configuration menu, you can see the current installed hardware in SATA ports.



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

SATA Mode Selection
The SATA mode is AHCI.

- **USB Configuration**



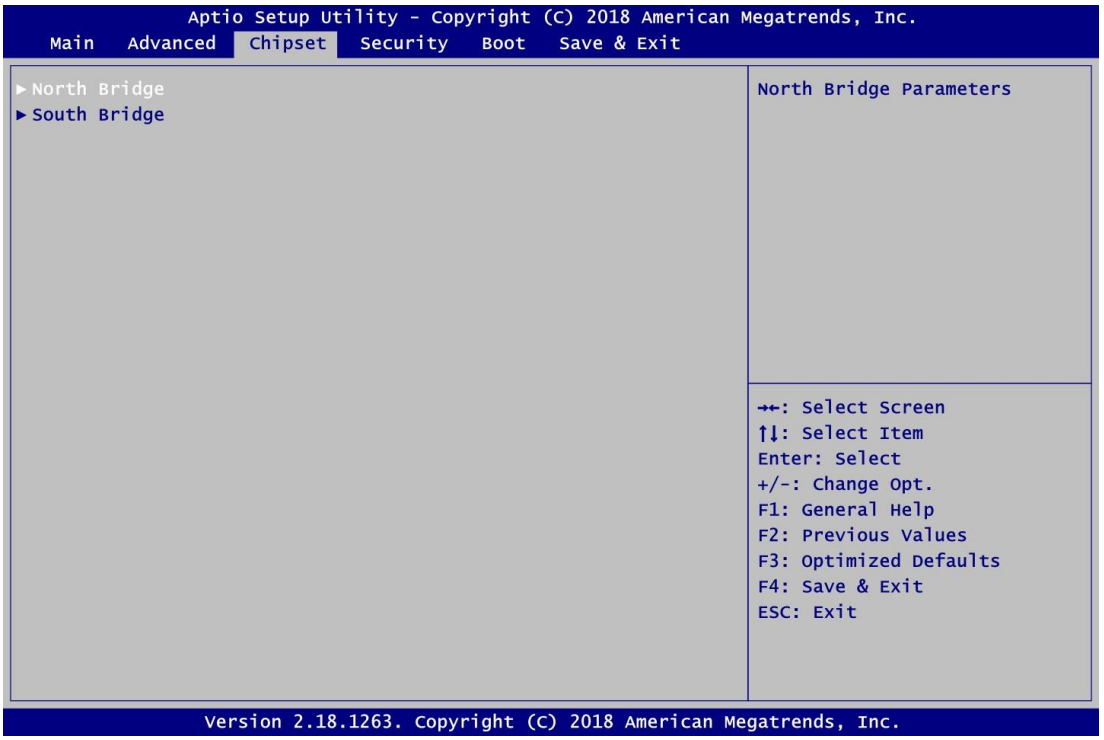
USB Devices
Display all detected USB device

4.5 Chipset Menu

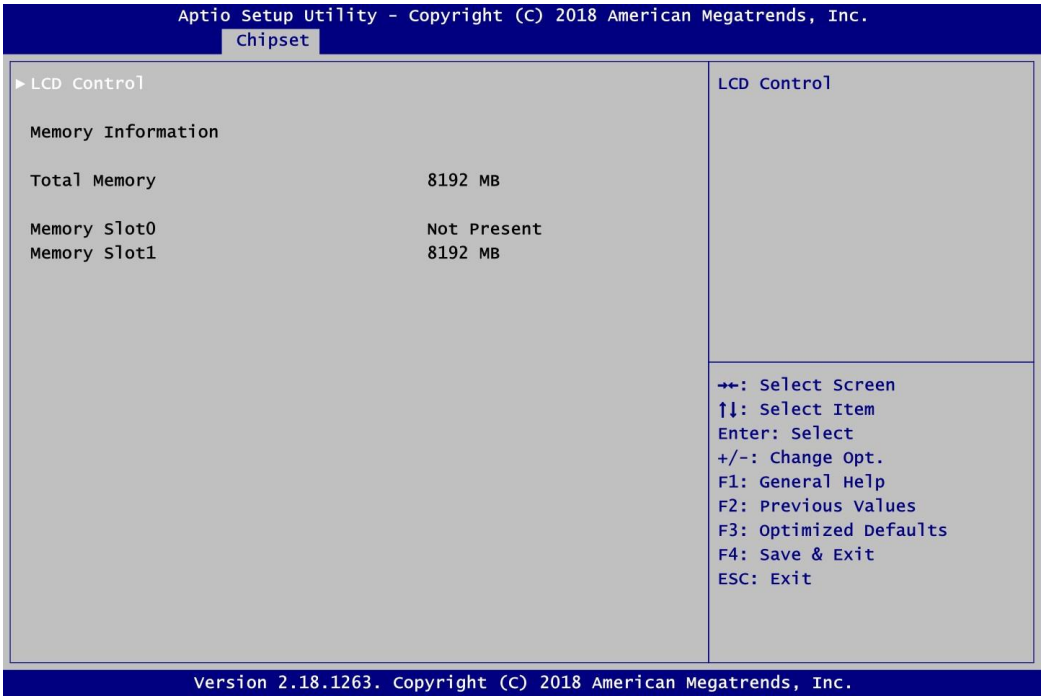
The Chipset menu allows users to change the advanced chipset settings. You can select any of the items in the left frame of the screen to go to the sub menus:

- ► North Bridge
- ► South Bridge

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

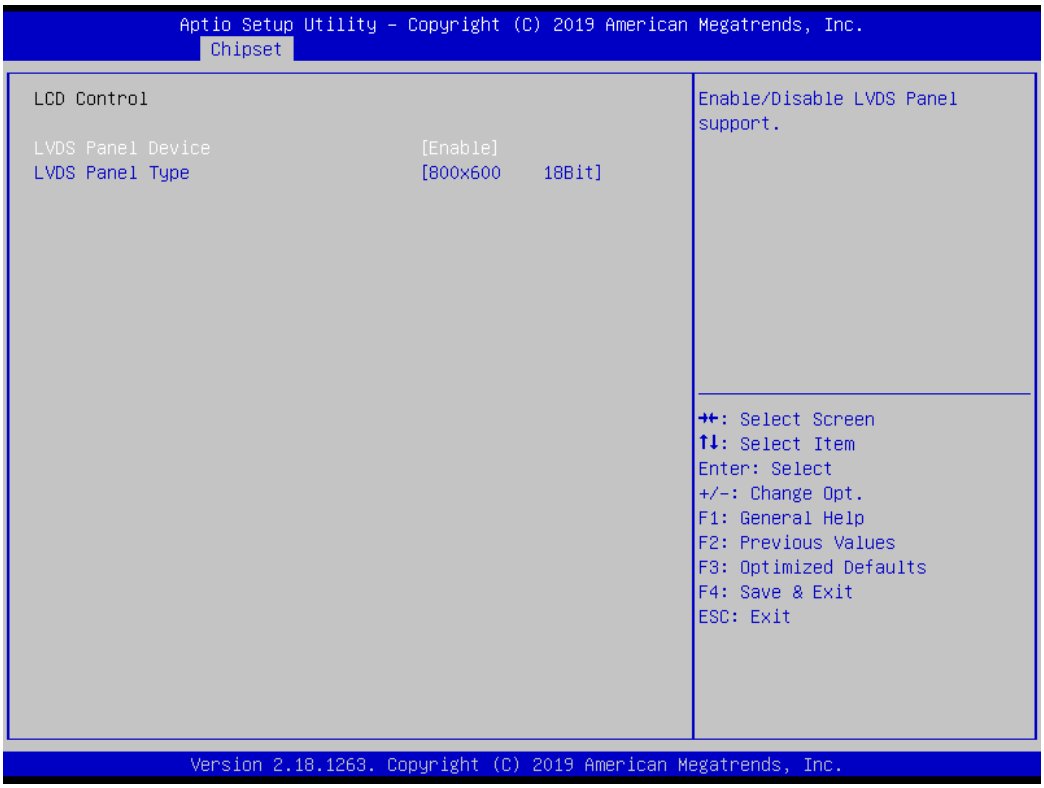


- **North Bridge**
  This screen allows users to configure parameters of North Bridge chipset.

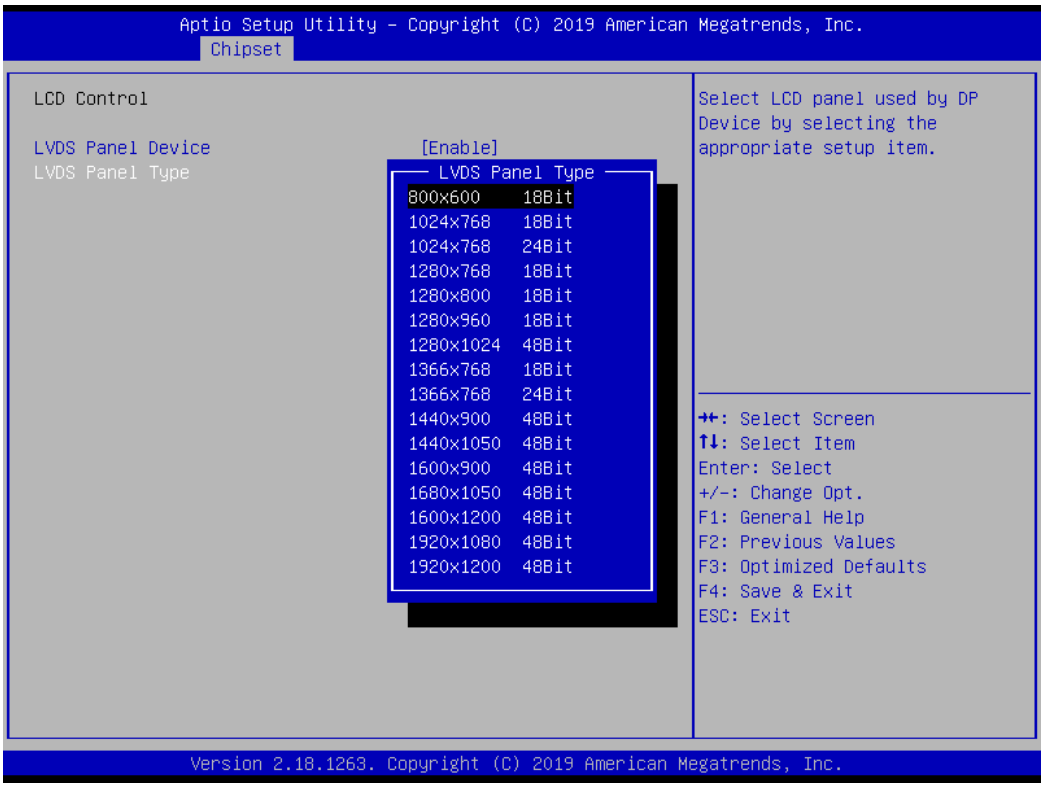


LCD Control
This item allows you to select LCD panel control options. Please press <Enter> to go to the sub menus.

Memory Information
Display system memory information.

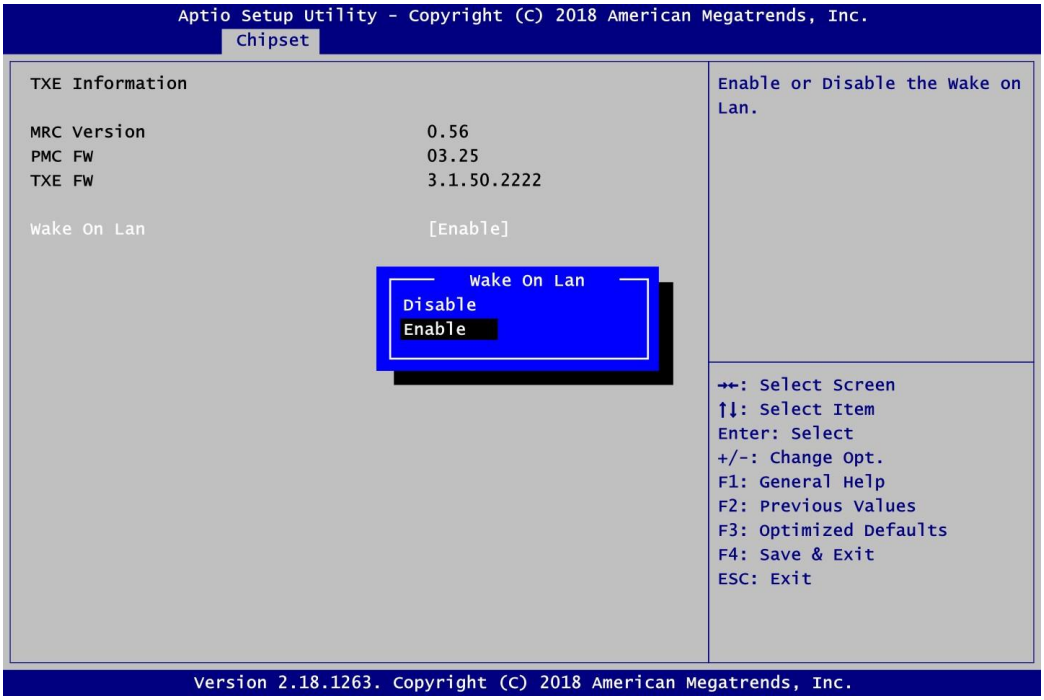


LVDS Panel Device
Enable or disable LVDS panel device. Default value is “Enable”.
If use VGA or HDMI display to install Linux OS, please set this option to “Disable”



LVDS Panel Type
Select LVDS panel resolution.

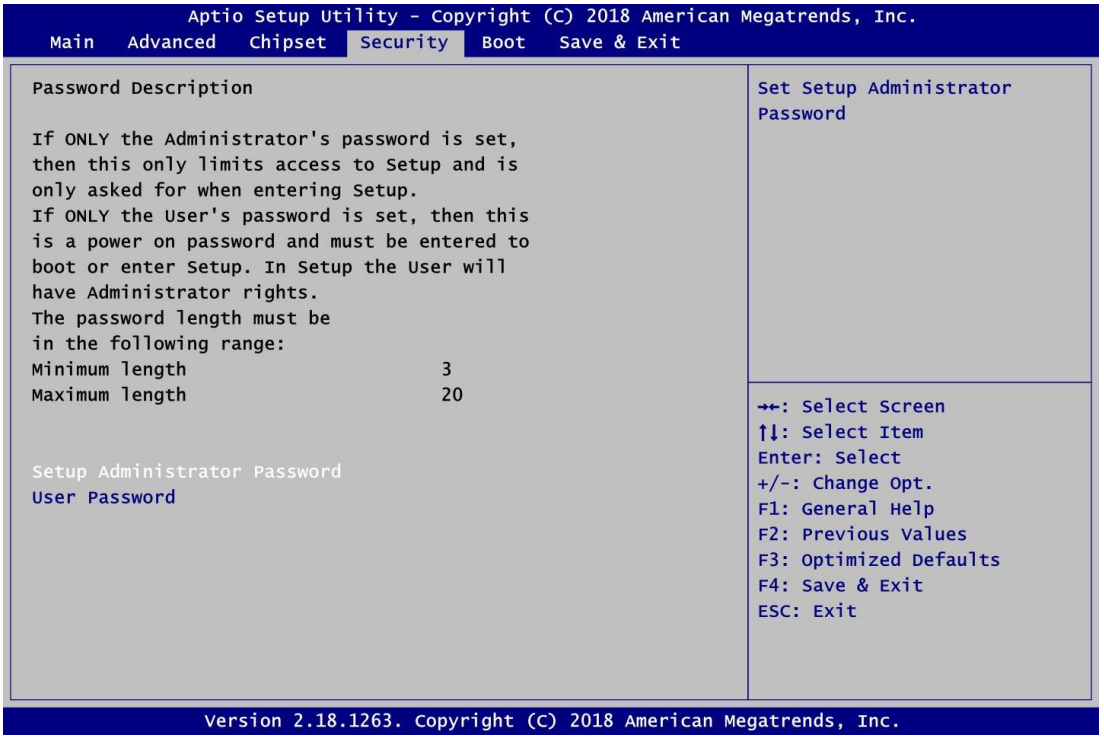
- **South Bridge**
  This screen allows users to configure parameters of South Bridge chipset.



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.

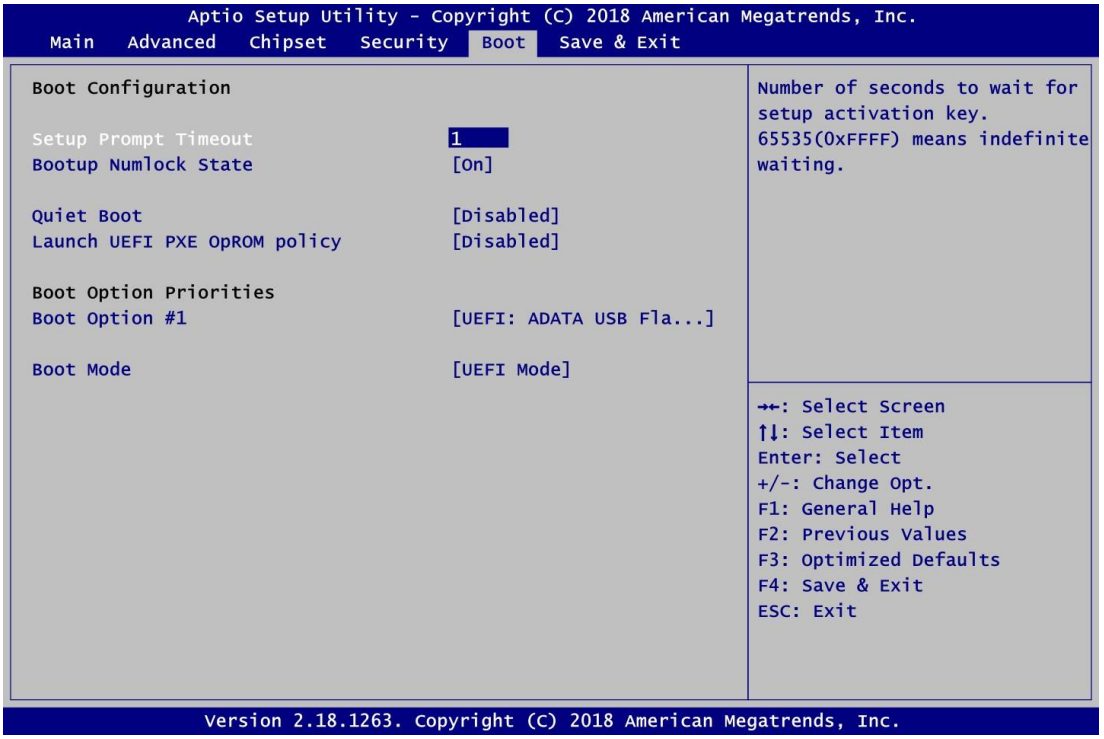


- **Setup Administrator Password**
  Set setup administrator password.

- **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.

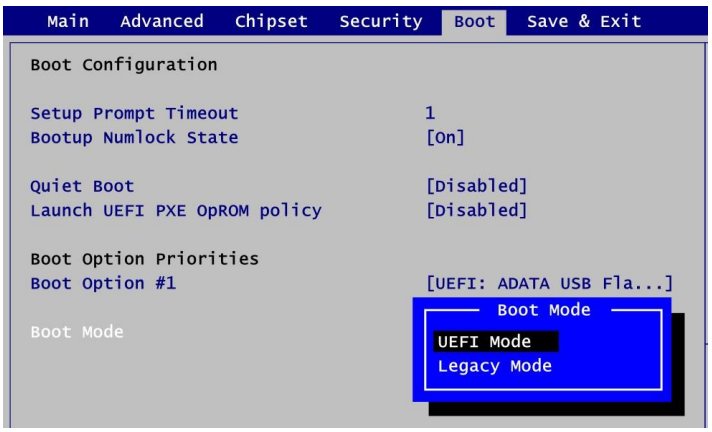
- **Bootup NumLock State**
  Use this item to select the power-on state for the keyboard NumLock.

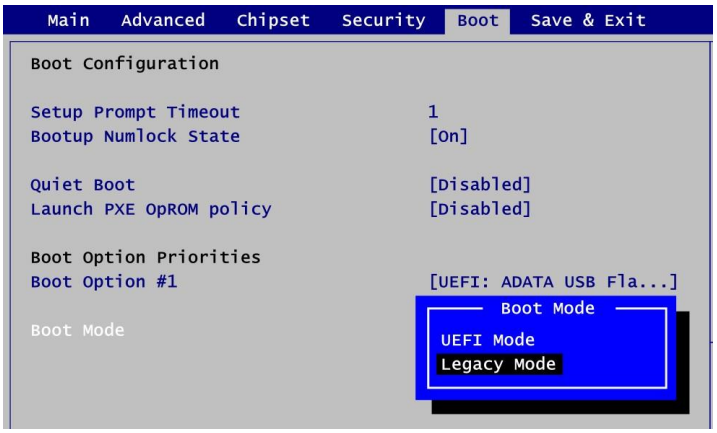
- **Quiet Boot**
  Select to display either POST output messages or a splash screen during boot-up.

- **Launch UEFI PXE OpROM policy**
  Control the execution of UEFI PXE OpROM.

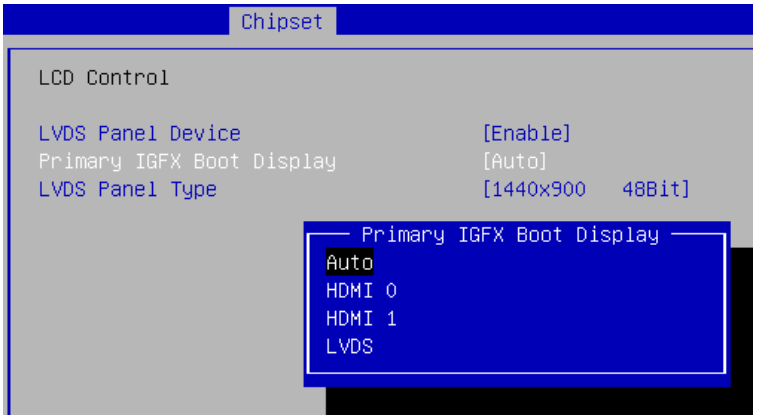
- **Boot Option Priorities [Boot Option #1, …]**
  These are settings for boot priority. Specify the boot device priority sequence from the available devices.

- **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.



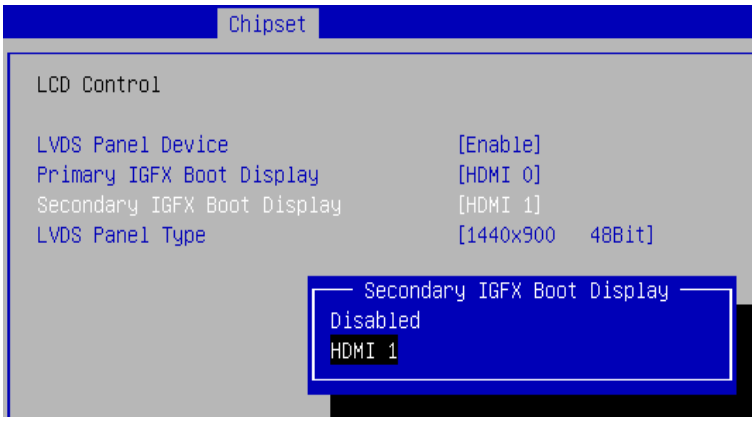


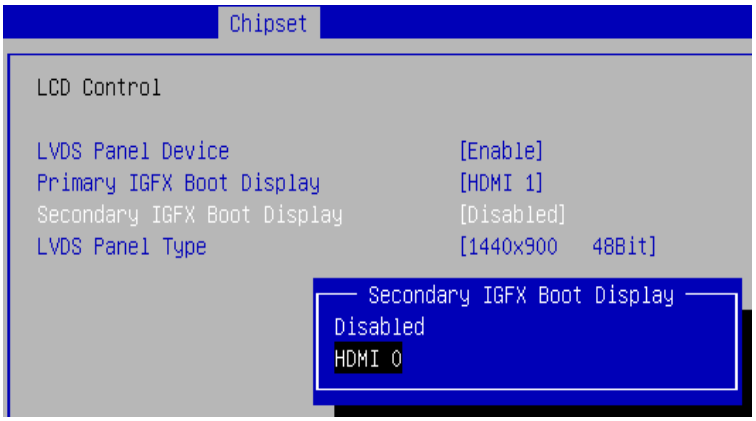
Note that the following Primary IGFX Boot Display option appears only if Legacy Mode is selected, see image below.

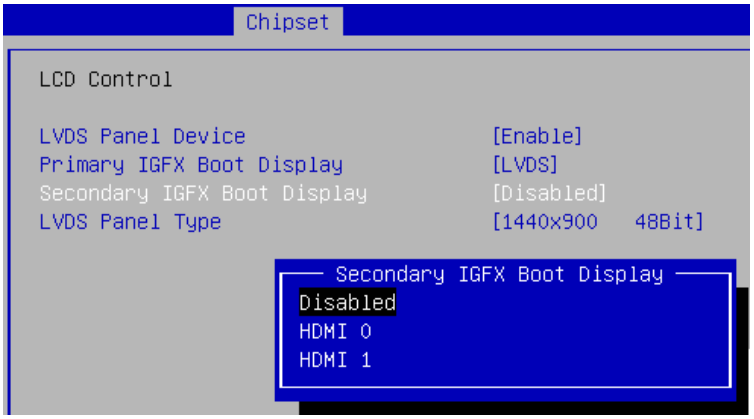


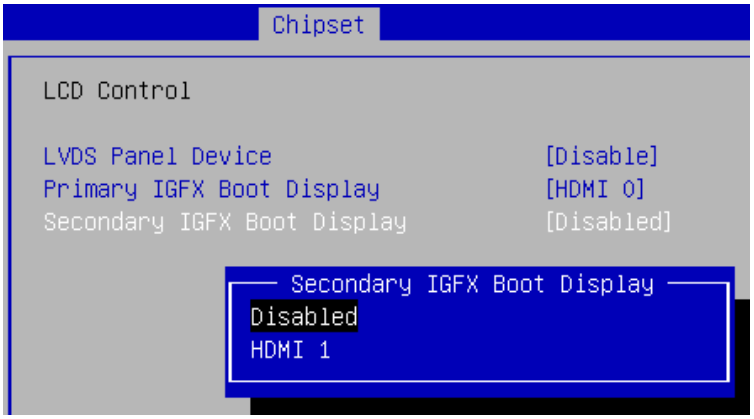
Primary IGFX Boot Display

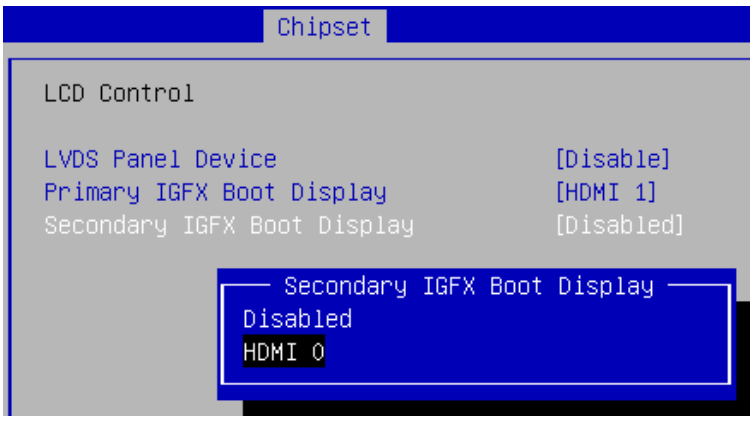
Select the video device which will be activated during POST (Power-On Self Test). The secondary boot display option appears based on your Primary IGFX Boot Display selection, see images below.





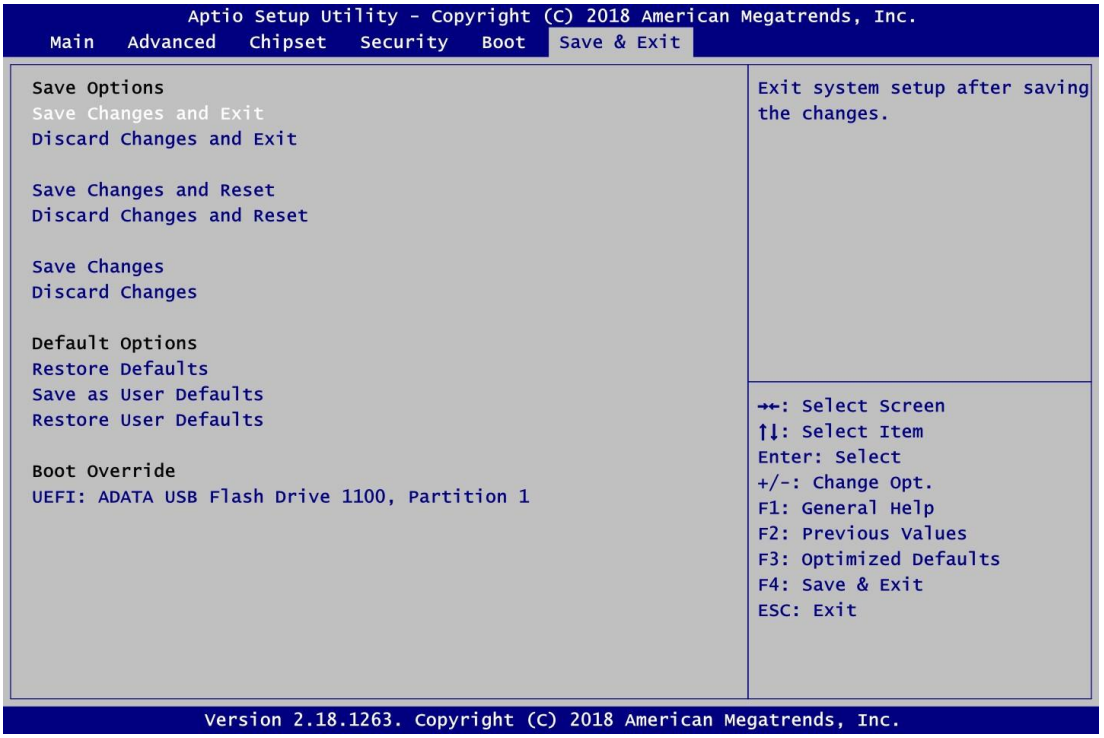

Chipset
LCD Control
LVDS Panel Device [Enable]
Primary IGFX Boot Display [LVDS]
Secondary IGFX Boot Display [Disabled]
LVDS Panel Type [1440x900 48Bit]
Secondary IGFX Boot Display
Disabled
HDMI 0
HDMI 1


Chipset
LCD Control
LVDS Panel Device [Disable]
Primary IGFX Boot Display [HDMI 0]
Secondary IGFX Boot Display [Disabled]
Secondary IGFX Boot Display
Disabled
HDMI 1


Chipset
LCD Control
LVDS Panel Device [Disable]
Primary IGFX Boot Display [HDMI 1]
Secondary IGFX Boot Display [Disabled]
Secondary IGFX Boot Display
Disabled
HDMI 0

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.

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
Digital I/O

B.1 About Digital I/O

The onboard GPIO or digital I/O has 16 bits (DIO1~16). Each bit can be set to function as input or output by software programming. In default, all pins are pulled high with +5V level (according to main power). The BIOS default settings for CN13/CN14 are 4 inputs and 4 outputs where all of these pins are set to 1.

B.2 Digital I/O Programming

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

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

#ifndef _STDINT_H
#define _STDINT_H
typedef unsigned char uint8_t;
#endif

#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_LOGICAL_DEVICE_GPIO      0x07
#define SIO_Offset_CN13_DIO_IN_OUT   0xCE
#define SIO_Offset_CN14_DIO_IN_OUT   0xCF
#define SIO_Offset_CN13_DIO_STATUS   0x0A06
#define SIO_Offset_CN14_DIO_STATUS   0x0A07
#define SIO_EXIT_CONFIGURATION_MODE  0x02

void main() {
     int DIO_CN_Select=0;
     int DIO_Access_Mode=0;
     uint8_t DIO_IN_OUT_Setting=0;
     uint8_t DIO_Status=0;
     char DIO_IN_OUT_Setting_Char[8];
     char DIO_Status_Char[8];
     int DIO_I_O = 0;
     int DIO_H_L = 0;
     uint8_t count=0x01;
     int j=0;

     printf("Select which DIO want to modified, 1:CN13 ; 2:CN14 :");
     scanf("%d",&DIO_CN_Select);
```

```
//
// 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_LOGICAL_DEVICE_GPIO);

printf("\nSelect access mode, 1:Read ; 2:Write :");
scanf("%d",&DIO_Access_Mode);

//=============================================================
// Read DIO settings and print it on the screen.
//=============================================================
if(DIO_Access_Mode ==1)
{
      if(DIO_CN_Select == 1) //Access CN13
      {
            DIO_CN_Select = 13;
            outportb(SIO_INDEX_PORT,SIO_Offset_CN13_DIO_IN_OUT);
            DIO_IN_OUT_Setting = inportb(SIO_DATA_PORT); // Read DIO IN/OUT status
            DIO_Status = inportb(SIO_Offset_CN13_DIO_STATUS); // Read DIO H/L status
      }
      else if(DIO_CN_Select == 2) //Access CN14
      {
            DIO_CN_Select = 14;
            outportb(SIO_INDEX_PORT,SIO_Offset_CN14_DIO_IN_OUT);
            DIO_IN_OUT_Setting = inportb(SIO_DATA_PORT); // Read DIO IN/OUT status
            DIO_Status = inportb(SIO_Offset_CN14_DIO_STATUS); // Read DIO H/L status
      }

      //
      // Notice: Below code just for print GPIO settings.
      //         Transfer data from unsigned integer to character
      //
      for(int i=0 ; i<8 ; i++)
      {
            if( (DIO_IN_OUT_Setting & count) == count)
                  DIO_IN_OUT_Setting_Char[i] = 'O';
            else
                  DIO_IN_OUT_Setting_Char[i] = 'I';
            if( (DIO_Status & count) == count)
                  DIO_Status_Char[i] = 'H';
            else
                  DIO_Status_Char[i] = 'L';

            count = count<<1;
      }

      printf("|----------------------------------------CN%d----------------------------------------|\n",DIO_CN_Select);
      printf("|-------------------------------------------------------------------------------------|\n");
      printf("|       |PIN0|PIN1|PIN2|PIN3|PIN4|PIN5|PIN6|PIN7|\n");
      printf("|-------|--- --|--- -|--- |---- |------- --|----- ---|-- ----| ----- |\n");
      printf("|In/Out| %c  |",DIO_IN_OUT_Setting_Char[0]);
      printf(" %c |",DIO_IN_OUT_Setting_Char[1]);
      printf(" %c |",DIO_IN_OUT_Setting_Char[2]);
      printf(" %c |",DIO_IN_OUT_Setting_Char[3]);
      printf(" %c |",DIO_IN_OUT_Setting_Char[4]);
      printf(" %c |",DIO_IN_OUT_Setting_Char[5]);
      printf(" %c |",DIO_IN_OUT_Setting_Char[6]);
      printf(" %c |\n",DIO_IN_OUT_Setting_Char[7]);
      printf("| H/L | %c |",DIO_Status_Char[0]);
      printf(" %c  |",DIO_Status_Char[1]);
      printf(" %c |",DIO_Status_Char[2]);
      printf(" %c |",DIO_Status_Char[3]);
      printf(" %c |",DIO_Status_Char[4]);
      printf(" %c |",DIO_Status_Char[5]);
      printf(" %c |",DIO_Status_Char[6]);
      printf(" %c  |\n",DIO_Status_Char[7]);
      printf("|-------------------------------------------------------------------------------------|\n");

}// end if(DIO_Access_Mode ==1)
```

```
//=============================================================================
// Enter the DIO settings and write into DIO registers.
//=============================================================================
else if(DIO_Access_Mode ==2)
{
      if(DIO_CN_Select == 1)
            printf("CN13 ");
      else if(DIO_CN_Select == 2)
            printf("CN14 ");

      printf("Input DIO In/Out status:\n");

      //
      // Enter the DIO settins for PIN0 to PIN7.
      //
      for(int i=0 ; i<8 ; i++)
      {
            printf("Pin%d In/Out (0:In ; 1:Out):",i);
            scanf("%d",&DIO_I_O);
            // left shift 1 bit to set I/O value
            DIO_IN_OUT_Setting = DIO_IN_OUT_Setting | (DIO_I_O<<i);
            printf("Pin%d H/L (0:Low ; 1:High):",i);
            scanf("%d",&DIO_H_L);
            DIO_Status = DIO_Status | (DIO_H_L<<i); // left shift 1 bit to set H/L value
      }

      //
      // Write DIO settings to CN13
      //
      if(DIO_CN_Select == 1)
      {
            // Set input or output to GPIO GROUP0(CN13) register
            outportb(SIO_INDEX_PORT,SIO_Offset_CN13_DIO_IN_OUT);
            outportb(SIO_DATA_PORT,DIO_IN_OUT_Setting);

            // Program H/L data to I/O space 0xA06 for GPIO GROUP0(CN13) which decoded
            // from BIOS
            outportb(SIO_Offset_CN13_DIO_STATUS,DIO_Status);
      }
      //
      // Write DIO settings to CN14
      //
      else if(DIO_CN_Select == 2)
      {
            // Set input or output to GPIO GROUP1(CN14) register
            outportb(SIO_INDEX_PORT,SIO_Offset_CN14_DIO_IN_OUT);
            outportb(SIO_DATA_PORT,DIO_IN_OUT_Setting);

            // Program H/L data to I/O space 0xA07 for GPIO GROUP1(CN14) which decoded
            // from BIOS
            outportb(SIO_Offset_CN14_DIO_STATUS,DIO_Status);
                        }

      }// end else if(DIO_Access_Mode ==2)

      //
      // Exit Configuration Mode
      //
      outportb(SIO_INDEX_PORT,SIO_EXIT_CONFIGURATION_MODE);
      outportb(SIO_INDEX_PORT,SIO_EXIT_CONFIGURATION_MODE);

      printf("DONE\n");

}
```