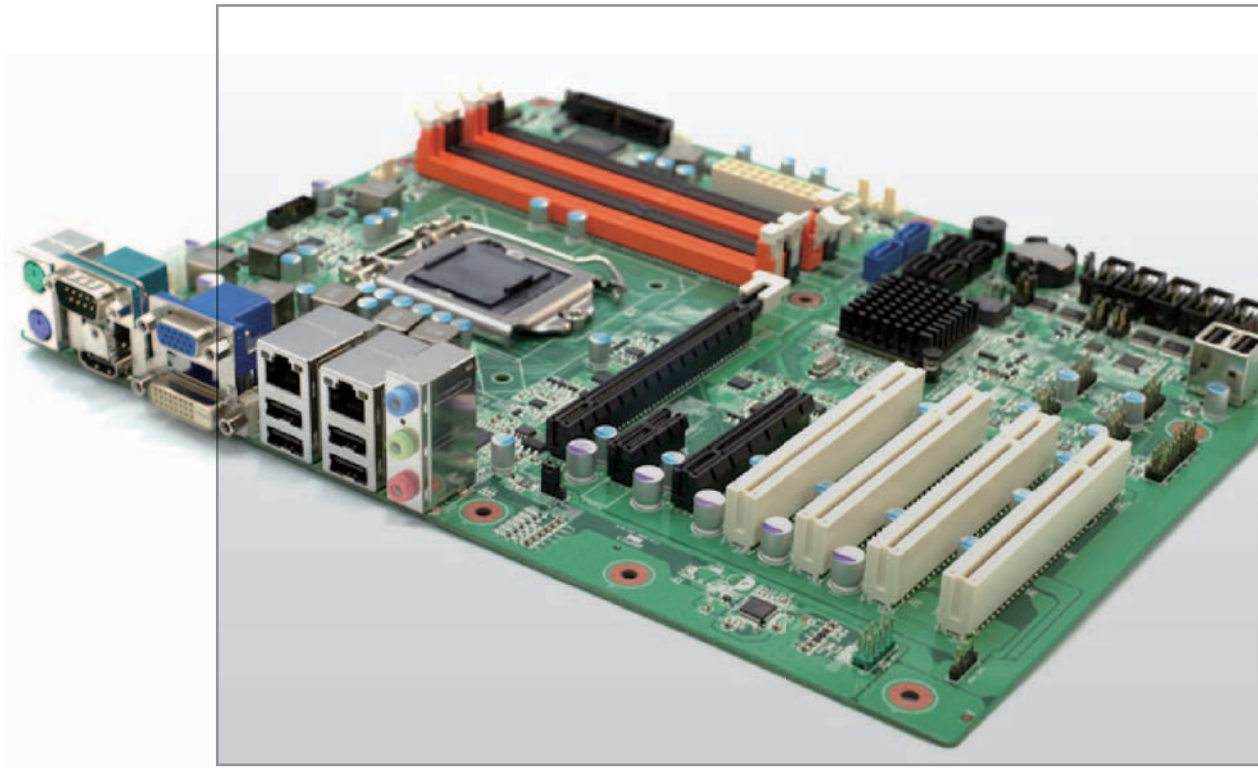
INS8145A

ATX Industrial Motherboard
User's Manual



Safety information

Electrical safety

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

Operation safety

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

Statement

- All product specifications are subject to change without prior notice

Revision History

Revision	Date (dd.mm.yyyy)	Changes
Version 1.0	15.07.2011	Initial release
Version 1.1	02.10.2013	Add GPIO feature

Packing list

- ☐ INS8145A ATX Industrial MB
- ☐ I/O shield
- ☐ 1 x SATA cable
- ☐ 1 x COM ports cable w/o bracket
- ☐ 1 x USB cable with bracket
- ☐ CD (Driver + user's manual)

Optional Accessories

- ☐ Processor
  - Intel® Core™ i7-2600 Processor (8M Cache, 3.40 GHz), 95W
  - Intel® Core™ i5-2400 Processor (6M Cache, 3.10 GHz), 95W
  - Intel® Core™ i3-2120 Processor (3M Cache, 3.30 GHz), 65W
  - Intel® Pentium® Processor G850 (3M Cache, 2.90 GHz), 65W
  - Intel® Celeron® Processor G540 (2M Cache, 2.50 GHz), 65W

If any of the above items is damaged or missing, contact your retailer.

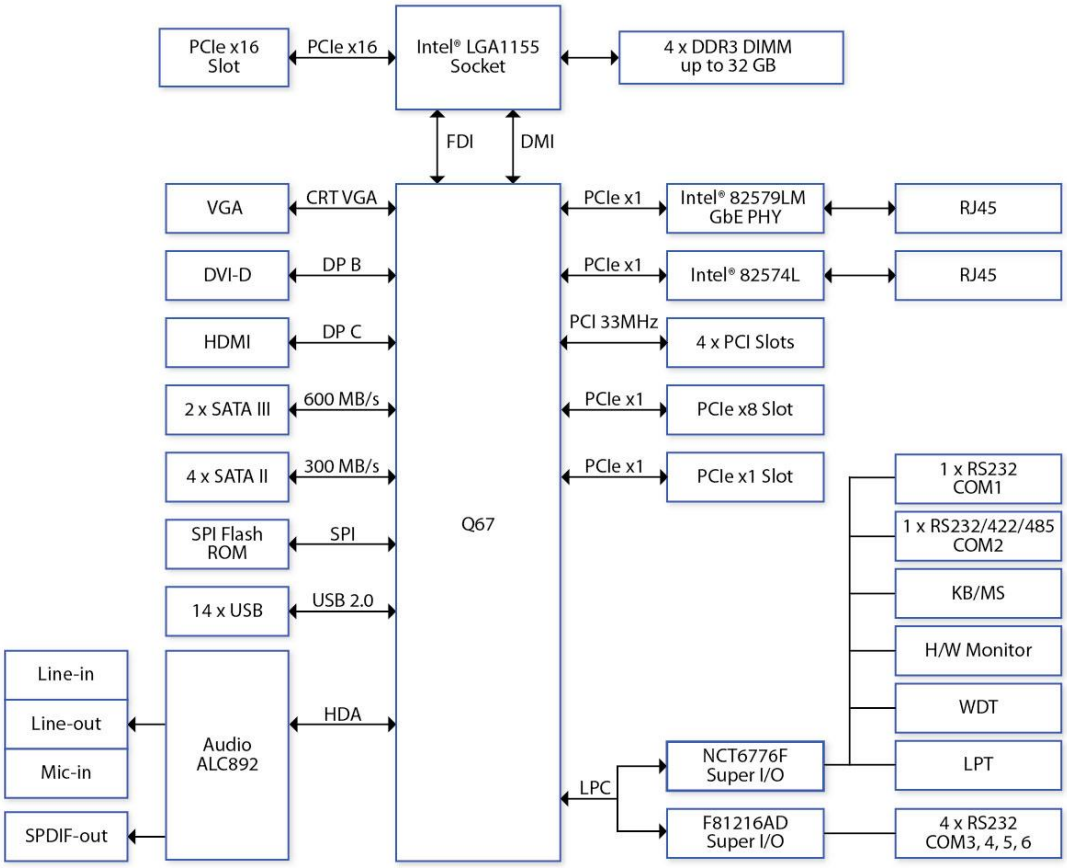
Ordering Information

Part Number	Description
INS8145A	ATX Industrial MB supports 32nm Intel® LGA 1155 Core™ i7/ i5/ i3

Table of Contents

Chapter 1: Product Information

1.1 Block Diagram



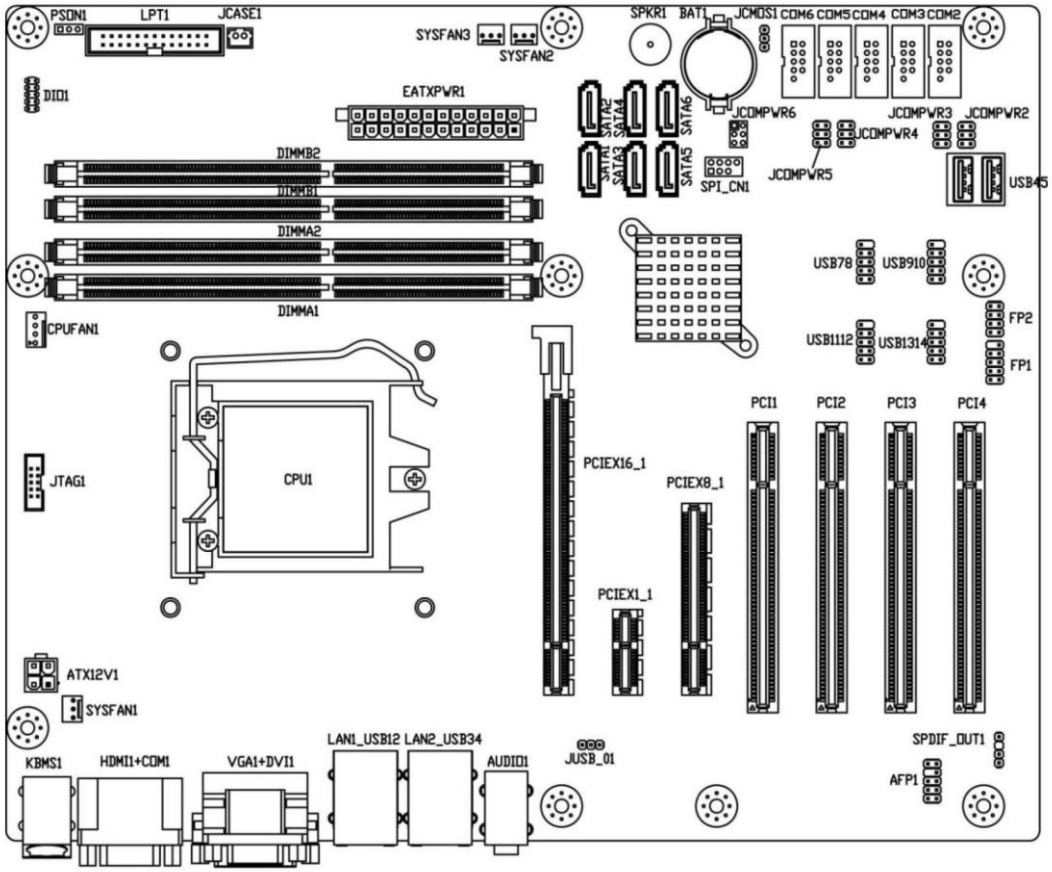
1.2 Key Features

Processor & System	
CPU Type	Intel® LGA 1155 socket Core™ i7/i5/i3 processor Core™ i7-2600 3.4 GHz (8M Cache, 95W) Core™ i5-2400 3.1 GHz (6M Cache, 95W) Core™ i3-2120 3.3 GHz (3M Cache, 65W) Pentium® G850 2.9 GHz (3M Cache, 65W) Pentium® G540 2.5 GHz (2M Cache, 65W)
Chipset	Intel® Q67 Express Chipset (Cougar Point) Controller Hub
Memory Type	4 x 240-pin 1066/1333 MHz Dual channel DDR3 SDRAM unbuffered DIMM support (Max. 32 GB)
BIOS	AMI® UEFI BIOS
Super I/O	NUVOTON NCT6776F
2nd I/O	F81216AD
iAMT	Support iAMT 7.0
Watchdog	1-255 sec. or 1-255 min. software programmable, can generated system reset
Expansion Slot	1 x PCIe x16 Gen.2 1 x PCIe x4 (x8 slot, one side open) 1 x PCIe x1 4 x PCI
Display	
Chipset	Intel® HD Grapics 2000 Integrated Graphics Engine
Display Interface	VGA/HDMI/DVI-D Integrated in the Intel® Q67
Audio	
Codec	ALC892 High Definition Audio Codec with Mic-in, Line-in, Line-out
Ethernet	
Controller	Intel® 82579LM & 82574L GbE
WOL	Yes
Boot from LAN	Yes for PXE
Rear I/O	
VGA	1
DVI-D	1
HDMI	1
Ethernet	2
Audio	Line-out, Mic-In, Line-in
USB	4 x USB2.0
COM1	1 x RS232/422/485 with 5V/12V selection
PS/2	1 x PS/2 Keyboard and mouse

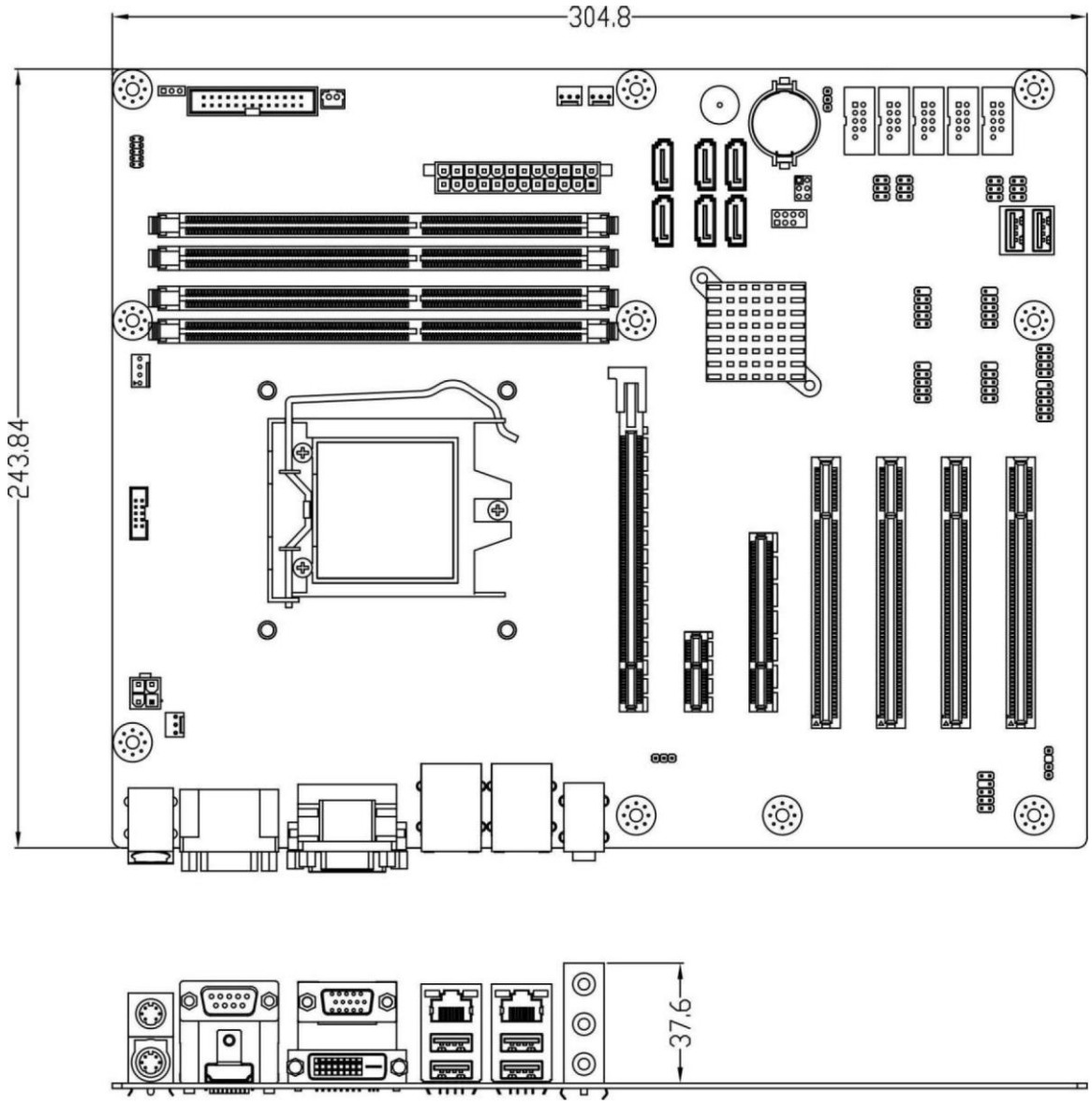
I/O Interface	
SATA	2 x SATAIII (6Gb/s, reserve space) 4 x SATAII (3Gb/s, reserve space) *6 x SATA RAID (S/W 0, 1, 5, 10) *2 x SATAIII & 4 x SATAII both support RAID 0,1,5,10
USB Port	10 x USB 1.1/2.0 port *8 port by 2 x 5-pin header *2 x Vertical USB connectors
COM Port	5 x COM ports *COM2 supports RS232/422/485 with 5V/12V selectable by pin header *COM3~6 support RS232 with 5V/12V selectable by pin header
FAN	CPU FAN (1 x 4-pin) System FAN (1 x 3-pin)
DIO	8-bit (4 in/4 out)
Mechanical and Environmetn	
Form Factor	ATX IMB
Power Type	ATX (24-pin + 4-pin)
Dimension	305 x 244 mm (12" x 9.6")
Operating Temperature	-20 to 70°C
Storage Temperature	-20 to 80°C
Relative humidity	10% to 90%, non-condensing

***Specification are subject to change without notice**

1.3 Board Placement



1.4 Mechanical Drawing



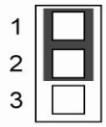
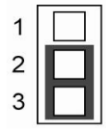
Chapter 2: Jumpers and Connectors

2.1 Onboard Connector List

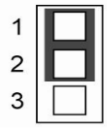
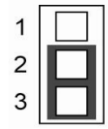
Connector name	Function
AFP1	HD AUDIO Front Panel
ATX12V1	4 pin ATX Power Input Connector
AUDIO1	3 Stack-up HD Audio Phone Jack
COM1	RS-232 / 422 / 485 COM1
COM2-6	RS-232 Port 2 Box Header
CPUFAN1	CPU FAN Wafer
DIMMA1-2	Primary DDR3 Memory DIMM Slot
DIMMB1-2	Secondary DDR3 Memory DIMM Slot
DIO1	Digital Input / Output Pin Header
EATXPWR1	24 pin ATX Power Input Connector
FP1-2	Front Panel Pin Header
HDMI1	HDMI Connector
JCASE1	Open case Box Header
JCOMPWR1-6	COM Signal / Power Selection
JCOMS1	Clear ME/CMOS Selection
JTAG1	Intel JTAG Box Header
JUSB_01	USB1234 Power Selection
KBMS1	PS/2 KB/MS Mini-DIN Connector
LAN1-2_USB1-4	LAN & USB2.0 Port Connector
LPT1	Parallel Port Box Header
PCI1-4	32-bit / 33Mhz / 5V-key PCI Slot
PCIEX1_1	Standard PCI Express x1 Slot
PCIEX16_1	Standard PCI Express x16 Slot
PCIEX8_1	None Standard PCI Express x8 Slot (X4)
PSON1	ATX/AT mode Selection
SATA1-2	Serial ATA 3.0 Connector
SATA3-6	Serial ATA 2.0 Connector
SPDIF_OUT1	SPD/IF Output Pin Header
SYSFAN1-3	System FAN Wafer
USB7-14	USB2.0 Port Pin Header
USB4-5	USB2.0 Port Vertical USB Connector
VGA1+DVI1	DVI-D + DB15 Connector

2.2 Jumper Settings

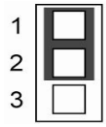
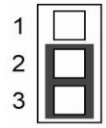
JCMOS1: Clear CMOS Jumper Setting

Jumper	Function description	Setting
1-2	Normal Operation	
2-3	Clear CMOS	
Default setting is 1-2		

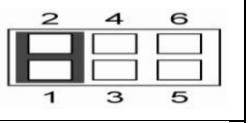
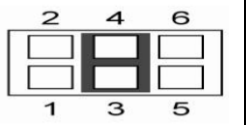
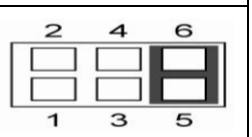
JUSB_01: USB1,2,3,4 Power Selection

Jumper	Function description	Setting
1-2	+5V	
2-3	5V Standby	
Default setting is 1-2		

PSON1: ATX/AT mode Selection

Jumper	Function description	Setting
1-2	AT Mode	
2-3	ATX Mode	
Default setting is 2-3		

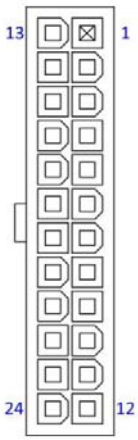
JCOMPWR1-6: COM Port Signal / Power Selection

Jumper	Function description	Setting	
1	COM port Pin 9 = RI#	1-2 Enabled	
2	COM port Pin 9 = +5V	3-4 Enabled	
3	COM port Pin 9 = +12V	5-6 Enabled	
Default setting is 1-2			

2.3 Onboard Connector Pin Assignment

EATXPWR1: 24-pin ATX Power Input Connector

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	POWER OK	20	N/C
9	+5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND

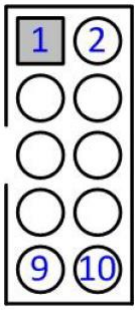


ATX12V1: 4-pin ATX Power Input Connector

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

2.7:COM2-6: RS-232 Box Header

Pin	Signal
1	DCD, Data carrier detect
2	RXD, Receive data
3	TXD, Transmit data
4	DTR, Data terminal ready
5	GND, ground
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	RI, Ring indicator
10	NC

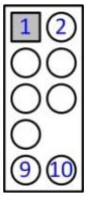


SPDIF_OUT1: SPD/IF Input / Output Pin Header

Pin	Signal Name
1	SPDIF_IN
2	GND
3	SPDIF_OUT
4	GND

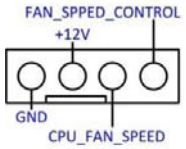
AFP1: HD AUDIO Front Panel

Pin	Signal	Pin	Signal
1	MIC2_L	2	AGND
3	MIC2_R	4	ACZ_DET
5	LIN2_R	6	MIC2_JD
7	SENSE	8	NC
9	LIN2_L	10	LINE2_JD



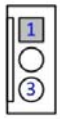
CPUFAN1: FAN Wafer

Pin	Signal
1	GND
2	+12V
3	FAN_RPM
4	FAN_RPM_CTL



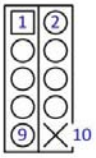
SFAN1-3: FAN Wafer Connector

Pin	Signal
1	GND
2	+12V
3	FAN_RPM



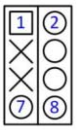
FP1: Front Panel 10-Pin Header

Pin	Signal	Pin	Signal
1	HDD LED +	2	Power LED +
3	HDD LED -	4	Power LED -
5	Reset Button -	6	Power Button +
7	Reset Button +	8	Power Button -
9		10	NC



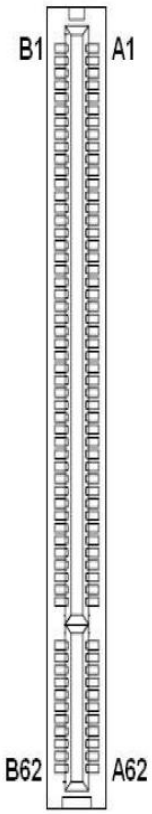
FP2: Front Panel 2-Pin Header

Pin	Signal	Pin	Signal
1	Speaker +	2	SMBus Clock
3	NC	4	SMBus Data -
5	NC	6	GND
7	Speaker -	8	Keyboard Lock



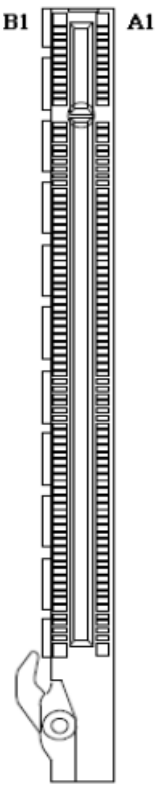
PCI1-4: 32-bit / 33Mhz / 5V PCI Slot

Pin	Side B	Side A	Pin	Side B	Side A
1	-12V	Reserved	35	IRDY#	Ground
2	Reserved	+12V	36	+3.3V	TRDY#
3	Ground	Reserved	37	DEVSEL#	Ground
4	Reserved	Reserved	38	Ground	STOP#
5	+5V	+5V	39	LOCK#	+3.3V
6	+5V	INTA#	40	PERR#	SMB_CLK
7	INTB#	INTC#	41	+3.3V	SMB_DAT
8	INTD#	+5V	42	SERR#	Ground
9	Reserved	GNT1# *	43	+3.3V	PAR
10	Reserved	+5V	44	C/BE[1]#	AD[15]
11	Reserved	IDSEL1 *	45	AD[14]	+3.3V
12	Ground	Ground	46	Ground	AD[13]
13	Ground	Ground	47	AD[12]	AD[11]
14	Reserved	+3.3VAUX	48	AD[10]	Ground
15	Ground	RST#	49	Ground	AD[09]
16	CLK0	+5V	50	KEY	
17	Ground	GNT0#	51		
18	REQ0#	Ground	52	AD[08]	C/BE[0]#
19	+5V	PME#	53	AD[07]	+3.3V
20	AD[31]	AD[30]	54	+3.3V	AD[06]
21	AD[29]	+3.3V	55	AD[05]	AD[04]
22	Ground	AD[28]	56	AD[03]	Ground
23	AD[27]	AD[26]	57	Ground	AD[02]
24	AD[25]	Ground	58	AD[01]	AD[00]
25	+3.3V	AD[24]	59	+5V	+5V
26	C/BE[3]#	IDSEL0	60	Reserved	Reserved
27	AD[23]	+3.3V	61	+5V	+5V
28	Ground	AD[22]	62	+5V	+5V
29	AD[21]	AD[20]			
30	AD[19]	Ground			
31	+3.3V	AD[18]			
32	AD[17]	AD[16]			
33	C/BE[2]#	+3.3V			
34	Ground	FRAME#			



PCIEX16_1: Standard PCI Express x16 Slot

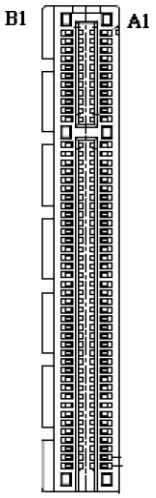
Pin	Side B	Side A
1	+12V	PRSNT#(B)
2	+12V	+12V
3	+12V	+12V
4	Ground	Ground
5	SMCLK	JTAG2
6	SMDAT	JTAG3
7	Ground	JTAG4
8	+3.3V	JTAG5
9	JTAG1	+3.3V
10	+3VSB	+3.3V
11	WAKE#	PWRGD
12	Reserved	Ground
13	Ground	REFCLK+
14	HSOP0	REFCLK-
15	HSON0	Ground
16	Ground	HSIP0
17	PRSNT#1	HSIP0
18	Ground	Ground
19	HSOP1	Reserved
20	HSON1	Ground
21	Ground	HSIP1
22	Ground	HSIP1
23	HSOP2	Ground
24	HSON2	Ground
25	Ground	HSIP2
26	Ground	HSIP2
27	HSOP3	Ground
28	HSON3	Ground
29	Ground	HSIP3
30	Reserved	HSIP3
31	PRSNT#2	Ground
32	Ground	Reserved
33	HSOP4	Reserved
34	HSON4	Ground



Pin	Side B	Side A
35	Ground	HSIP4
36	Ground	HSIP4
37	HSOP5	Ground
38	HSON5	Ground
39	Ground	HSIP5
40	Ground	HSIP5
41	HSOP6	Ground
42	HSON6	Ground
43	Ground	HSIP6
44	Ground	HSIP6
45	HSOP7	Ground
46	HSON7	Ground
47	Ground	HSIP7
48	PRSNT#3	HSIP7
49	Ground	Ground
50	HSOP8	Reserved
51	HSON8	Ground
52	Ground	HSIP8
53	Ground	HSIP8
54	HSOP9	Ground
55	HSON9	Ground
56	Ground	HSIP9
57	Ground	HSIP9
58	HSOP10	Ground
59	HSON10	Ground
60	Ground	HSIP10
61	Ground	HSIP10
62	HSOP11	Ground
63	HSON11	Ground
64	Ground	HSIP11
65	Ground	HSIP11
66	HSOP12	Ground
67	HSON12	Ground
68	Ground	HSIP12
69	Ground	HSIP12

PCIEX8_1: None Standard PCI Express x8 Slot (X4)

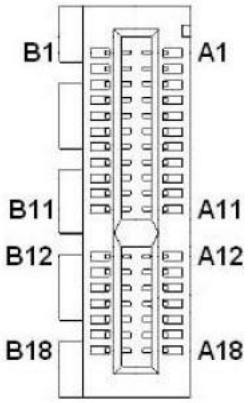
Pin	Side B	Side A
1	+12V	PRSNT#(B)
2	+12V	+12V
3	+12V	+12V
4	Ground	Ground
5	SMCLK	JTAG2
6	SMDAT	JTAG3
7	Ground	JTAG4
8	+3.3V	JTAG5
9	JTAG1	+3.3V
10	+3VSB	+3.3V
11	WAKE#	PWRGD
12	Reserved	Ground
13	Ground	REFCLK+
14	HSOP0	REFCLK-
15	HSON0	Ground
16	Ground	HSIP0
17	PRSNT#1	HSIP0
18	Ground	Ground
19	HSOP1	Reserved
20	HSON1	Ground
21	Ground	HSIP1
22	Ground	HSIP1
23	HSOP2	Ground
24	HSON2	Ground
25	Ground	HSIP2
26	Ground	HSIP2
27	HSOP3	Ground
28	HSON3	Ground
29	Ground	HSIP3
30	Reserved	HSIP3
31	Reserved	Ground
32	Ground	Reserved
33	Reserved	Reserved
34	Reserved	Reserved



Pin	Side B	Side A
35	Reserved	Reserved
36	Reserved	Reserved
37	Reserved	Reserved
38	Reserved	Reserved
39	Reserved	Reserved
40	Reserved	Reserved
41	Reserved	Reserved
42	Reserved	Reserved
43	Reserved	Reserved
44	Reserved	Reserved
45	Reserved	Reserved
46	Reserved	Reserved
47	Reserved	Reserved
48	Reserved	Reserved
49	Reserved	Reserved

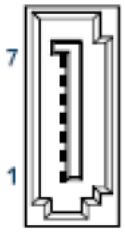
PCIEX1 Slot

Pin	Side B	Side A
1	+12V	+3.3V
2	+12V	+3.3V
3	+3.3VAUX	Ground
4	WAKE#	REFCLK+
5	RST#	REFCLK-
6	Ground	Ground
7	PETp0	PERp0
8	PETn0	PERn0
9	Ground	Ground
10	PETp1	PERp1
11	PETn1	PERn1
12	SMB_CLK	SMB_DAT
13	Ground	Ground
14	PETp2	PERp2
15	PETn2	PERn2
16	Ground	Ground
17	NC	NC
18	NC	NC



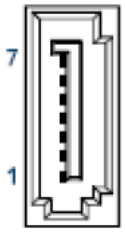
SATAI1-2: Serial ATA 3.0 Connector

Pin	Signal Name
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND



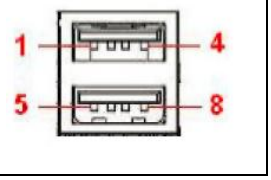
SATAI3-6: Serial ATA 2.0 Connector

Pin	Signal Name
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND



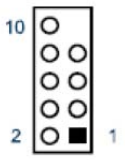
USB4.5: USB2.0 Vertical Connector

Pin	Signal Name	Pin	Signal Name
1	+5V	2	USB_A-
3	USB_A+	4	GND
5	+5V	6	USB_B-
7	USB_B+	8	GND



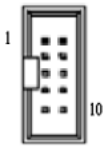
USB7-14: USB2.0 Pin Header

Pin	Signal Name	Pin	Signal Name
1	+5V	2	+5V
3	USB_A-	4	USB_B-
5	USB_A+	6	USB_B+
7	GND	8	GND
9	KEY	10	GND



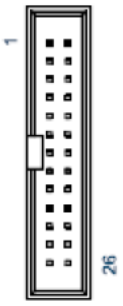
JTAG1: TAG Port Box Header

Pin	Signal	Pin	Signal
1	ITP_TCK	2	+3.3V
3	ITP_TMS	4	GND
5	ITP_TDI	6	GND
7	ITP_TDO	8	GND
9	ITP_RST#	10	NC



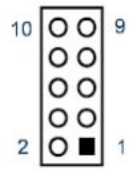
LPT1/Parallel Port Box Header

Pin	Signal	Pin	Signal
1	Line printer strobe	2	AutoFeed
3	PD0, parallel data 0	4	Error
5	PD1, parallel data 1	6	Initialize
7	PD2, parallel data 2	8	Select In
9	PD3, parallel data 3	10	Ground
11	PD4, parallel data 4	12	Ground
13	PD5, parallel data 5	14	Ground
15	PD6, parallel data 6	16	Ground
17	PD7, parallel data 7	18	Ground
19	ACK, acknowledge	20	Ground
21	Busy	22	Ground
23	Paper empty	24	Ground
25	Select		



DIO1: Digital Input / Output Pin Header

Pin	Signal	PCH	Pin	Signal	PCH
1	Digital GPIO 0	GP70	2	Digital GPIO 4	GP74
3	Digital GPIO 1	GP71	4	Digital GPIO 5	GP75
5	Digital GPIO 2	GP72	6	Digital GPIO 6	GP76
7	Digital GPIO 3	GP73	8	Digital GPIO 7	GP77
9	+5VIO		10	GND	



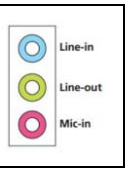
JCASE1: Open Case Box Header

Pin	Signal Name
1	CASE OPEN#
2	GND

2.4 Rear Panel Pin Assignments

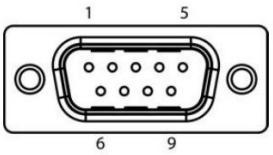
AUDIO1: 3 Stack-up HD Audio Phone Jack

Color	Signal Name
Blue	Line-in
Green	Line-out
Pink	Mic-in



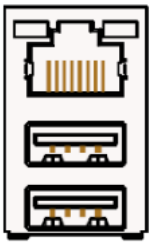
COM1 (RS-232/422/485 Port A DB-9 Connector)

Pin	RS-232	RS-422	Half Duplex RS-485
1	DCD	TX-	DATA-
2	RXD	TX+	DATA+
3	TXD	RX+	NA
4	DTR	RX-	NA
5	GND	GND	GND
6	DSR	NA	NA
7	RTS	NA	NA
8	CTS	NA	NA
9	+5V/+12V/RI	+5V/+12V/NA	+5V/+12V/NA

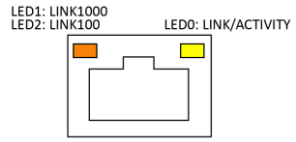


RJ-45 + 2 USB 2.0 Connector

Pin	Signal	Pin	Signal
L1	VCC	L12	GLED+
L2	MDI[0]+	L13	OLED-
L3	MDI[0]-	L14	GLED-
L4	MDI[1]+	U1	+5VSV
L5	MDI[1]-	U2	USB_A-
L6	MDI[2]+	U3	USB_A+
L7	MDI[2]-	U4	GND
L8	MDI[3]+	U5	+5VSB
L9	MDI[3]-	U6	USB_B-
L10	GND	U7	USB_B+
L11	GLED-	U8	GND

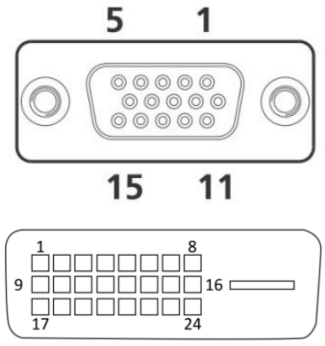


SPEED LED: (Lift)	ACTIVE LED: (Right)
GREEN: 1000Mbps	YELLOW (BLINKING): ACTIVITY
ORANGE: 100Mbps	No Light: NOT LINK
No Light: 10Mbps	YELLOW (NO BLINKING): LINK



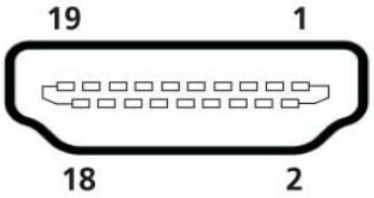
VGA1+DVI1: DVI-D + DB15 Connector

Pin	Signal	Pin	Signal
1	Tx2-	V1	R
2	Tx2+	V2	G
3	GND	V3	B
4	TX4-	V4	NC
5	TX4+	V5	GND
6	DDC_CLK	V6	VGA_EN
7	DDC_DATA	V7	GND
8	CRT_VSYNC	V8	GND
9	TX1-	V9	PWR
10	TX1+	V10	GND
11	GND	V11	NC
12	TX3-	V12	SD_DATA
13	TX3+	V13	CRT_HSYNC
14	+5V	V14	CRT_VSYNC
15	GND	V15	SD_CLK
16	HTPLG	V16	GND
17	TX0-	V17	GND
18	TX0+	C1	NC
19	GND	C2	NC
20	TX5-	C3	NC
21	TX5+	C5	NC
22	GND	C5A	NC
23	TXC+	25	GND
24	TXC-	26	GND



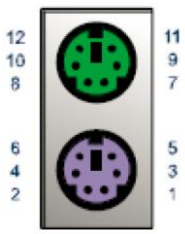
HDMI Connector

Pin	Signal
1	TMDS Data2+
2	TMDS Data2 Shield
3	TMDS Data2–
4	TMDS Data1+
5	TMDS Data1 Shield
6	TMDS Data1–
7	TMDS Data0+
8	TMDS Data0 Shield
9	TMDS Data0–
10	TMDS Clock+
11	TMDS Clock Shield
12	TMDS Clock–
13	Reserved
14	Reserved
15	SCL
16	SDA
17	DDC/CEC Ground
18	+5 V Power
19	Hot Plug Detect



KBMS1: PS/2 KB/MS Mini-DIN Connector

Pin	Signal	Function
1	KBDAT	Keyboard Data
2	NC	No Connect
3	GND	Ground
4	KB5V	+5VSB Power Source
5	KBCLK	Keyboard Clock
6	NC	No Connect
7	MSDAT	Mouse Data
8	NC	No Connect
9	GND	Ground
10	KB5V	+5VSB Power Source
11	MSCLK	Mouse Clock
12	NC	No Connect



Chapter 3: Getting Started

This chapter provides information on how to install components to the INS8145A. Specifically, the installation of CPU, memory modules, and operating system are explained.

3.1 Installing the CPU

The INS8145A supports the Intel® 32 nm Sandy Bridge Processor (LGA1155 socket H2)

Disconnect all power supplies to the board before installing a CPU to prevent damage to the board and CPU.

Do not touch the socket contacts. Damaging the contacts voids the product warranty. Carefully follow the installation instructions to avoid damaging the motherboard components.

To install the CPU:

1. Press and release the load lever (A) from the retention tab (B).

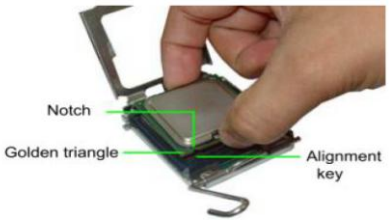
2. Lift and rotate the load lever to unlock the load plate.

3. Lift the load plate until it is fully open.

4. Push and remove the protective socket cover (plastic) from the load plate.

5. Unpack the new processor and remove any protective material.

6. Align the processor over the socket and make sure the CPU notch is aligned with the alignment key on the socket.

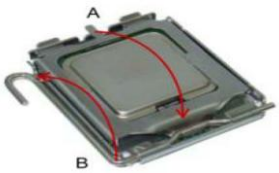


The CPU fits the socket in only one orientation.
DO NOT force it into the socket to avoid

7. Carefully place the CPU in the socket.

8. Close the load plate until the CPU is covered and secured.

9. Rotate the load lever (A) and secure it to the retention tab (B)



3.2 System Memory

The IN8145A supports up to 32GB of DDR3 1333 SDRAM in four 240-pin DIMM sockets.

Memory Configurations

Dual channel configuration is supported by the IN8145A as follows:
Channel A: DIMMA1 and DIMMA2
Channel B: DIMMB1 and DIMMB2
Unbuffered non-ECC DDR2 DIMMs with capacities of 256 MB, 512 MB, 1 GB and 2 GB can be installed into the DIMM sockets as follows:

- Memory modules of varying sizes may be installed in Channel A and Channel B. The system maps the total size of the channel with the lowest capacity for dual-channel configuration. Any excess memory from the channel with higher capacity is then mapped for single-channel operation.
- Always install DIMMs with the same CAS latency. For optimum compatibility, it is recommended that you obtain memory modules from the same vendor.
- Due to chipset resource allocation, the system may detect less than 4 GB system memory when four 1 GB DDR2 memory modules are installed.
  Note: Windows XP 32-bit operation system does not support Physical Address Extension (PAE).
- The IN8145A does not support memory modules with 128 MB chips or double-sided x16 memory modules.

Memory Module Installation

The DDR2 memory modules are notched to facilitate correct installation in the DIMM sockets.

	Disconnect all power supplies to the board before installing a memory module to prevent damage to the board and memory module

To install a memory module:

1. Locate the memory module slots on the motherboard.
2. Push the socket retaining clips outward to unlock the slots.
3. Align the memory module with the socket to make sure the notch aligns with the break on the socket.
4. Insert the module firmly into the desired slot until the retaining clips lock and secure the memory module.

.

3.3 Driver Installation

The INS8145A drivers for Windows XP 32-bit are located in the following directories on the Driver DVD, or can be downloaded from the Perfectron website (http://www.perfectron.com).

Follow the instructions below to install the required INS8145A drivers:

1. Install the Microsoft Windows operating system before installing any drivers. Most standard I/O device drivers are installed during installation.
2. Install the chipset driver by running the program X:\INS8145A Driver\INF\setup.exe. Follow the provided instructions and reboot the computer when instructed.

3. Install the display driver and utilities by running the program X:\INS8145A Driver\VGA\WIN2KXP_32\setup.exe. Follow the provided instructions and reboot the computer when instructed.

4 Install the LAN driver by running the program X:\INS8145A Driver\LAN\Windows\2000_ XP_2003 Server\PRO2KXP.exe. Follow the provided instructions and reboot the computer, if is required.

5 Install the Audio driver by running the program X:\INS8145A Driver\Audio\32bit\2K_XP\setup.exe. Follow the provided instructions and reboot the computer, if required.

Chipset	X:\INS8145A Driver\INF
Display	X:\INS8145A Driver\VGA\WIN2KXP_32
LAN	X:\INS8145A Driver\LAN\Windows\2000_ XP_2003 Server
Audio	X:\INS8145A Driver\Audio\32bit\2K_XP

Chapter 4: AMI BIOS UTILITY

This chapter provides users with detailed descriptions on how to set up a basic system configuration through the AMIBIOS8 BIOS setup utility.

4.1 Starting

To enter the setup screens, perform the following steps:

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

4.2 Navigation Keys

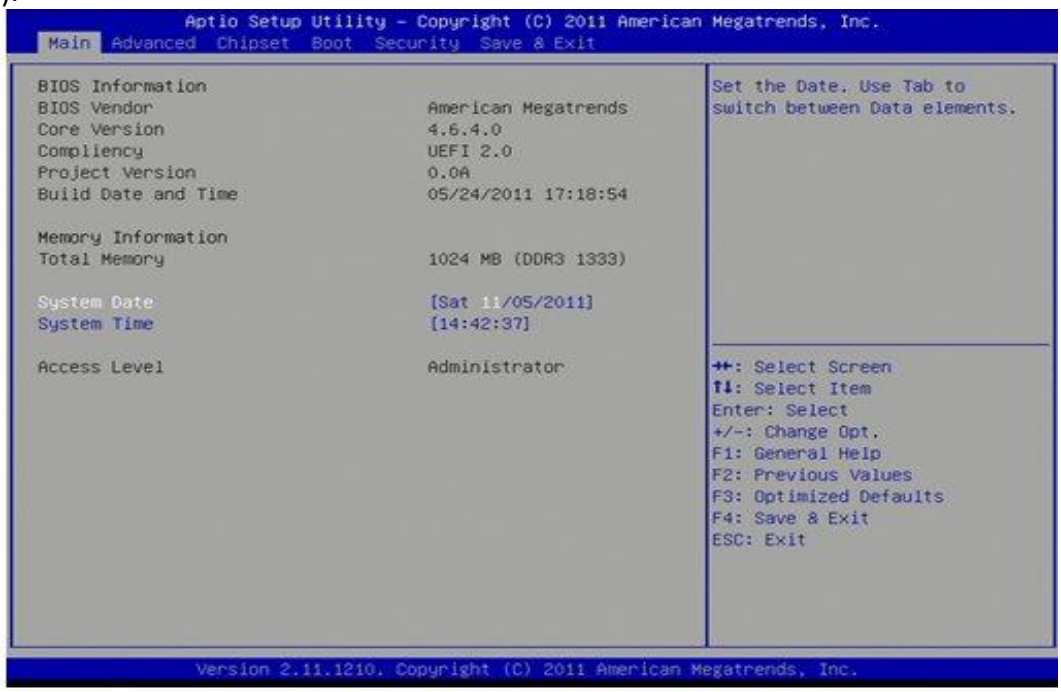
The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process.
Some of the hot keys are <F1>, <F10>, <Enter>, <ESC>, and <Arrow> keys.

Note Some of the navigation keys may differ from the displayed information on the screen.
Note The default values are displayed in parenthesis, for example: (Enabled).

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

4.3 Main Menu

The Main menu is the screen that first displays when BIOS Setup is entered, unless an error has occurred. Note: The default values are displayed in parenthesis, for example: (Enabled).

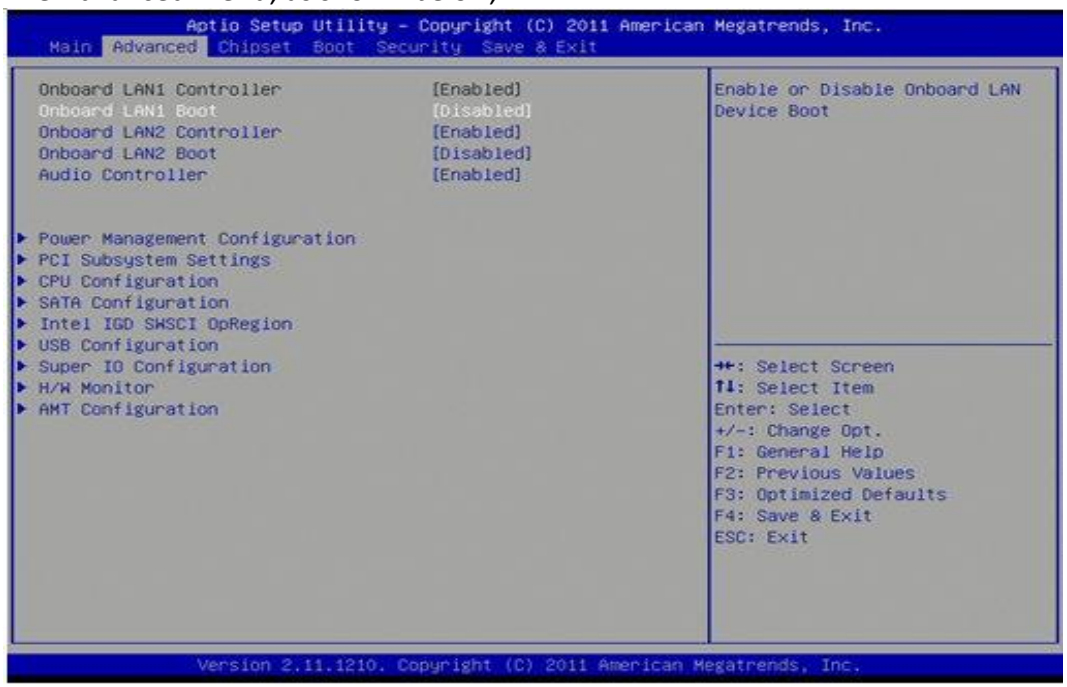


The following information is found on the **Main** menu:

- BIOS Information
- BIOS Vendor: displays the BIOS vendor (AMI BIOS).
- Core version: displays the BIOS version. Check this version number when updating BIOS from the manufacturer.
- Compliency: Unified Extensible Firmware Interface (UEFI) 2.0
- Build Date and Time: Displays the BIOS released date.
- System Date: Select this option to change the system date.
- System Time: Select this option to change the system time.
- Access Level: select this option to change the level of user authorization (user, administrator)

4.4 Advanced Menu

The Advanced menu, as shown below,

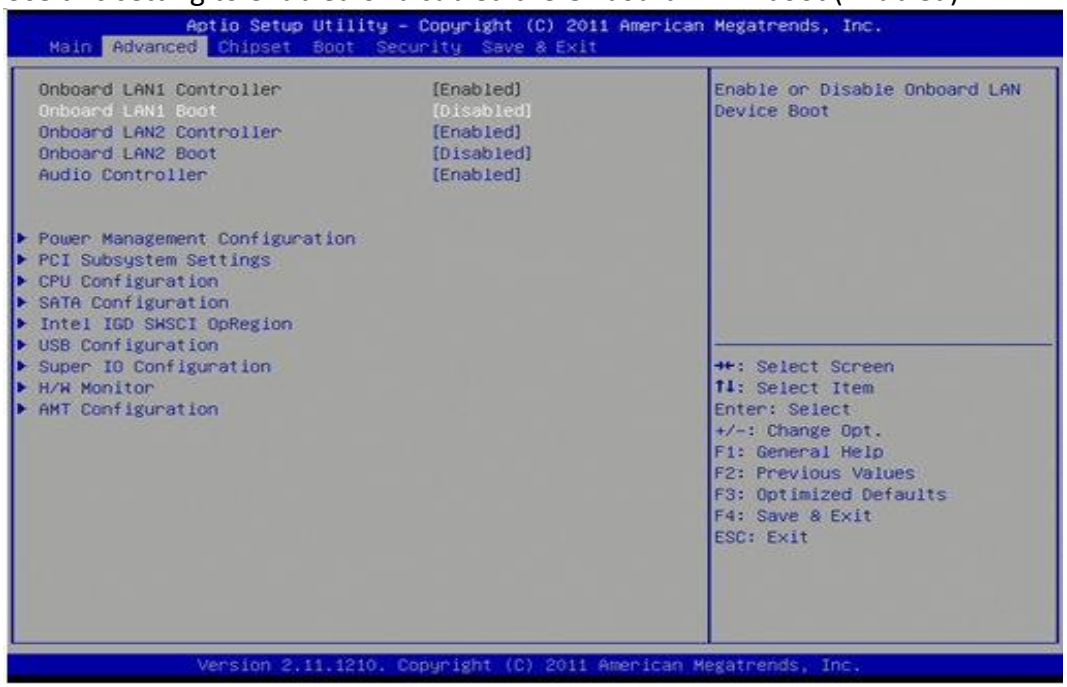


The following settings are available:

- Onboard LAN1 Controller
- Onboard LAN1 Boot: select this option to enable or disable the LAN1 boot option (Disabled)
- Onboard LAN2 Controller: select this option to enable or disable the LAN2 controller (Enabled)
- Onboard LAN2 Boot: select this option to enable or disable the LAN2 boot option (Disabled)
- Audio Controller: select this option to enable or disable the Audio controller (Enabled)
- Power Management Configuration: select this option to enable system power parameters.
- PCI Subsystem Settings: select this option to enter the PCI subsystem menu.
- CPU Configuration: select this option to enter the CPU configuration menu.
- SATA Configuration: select this option to enter the serial ATA configuration menu.
- Intel IGD SWSCI Configuration: select this option to enter the software SCI menu.
- USB Configuration: select this option to enter the USB configuration menu.
- Super IO Configuration: select this option to enable the configuration of the onboard serial ports.
- H/W Monitor
- AMT Configuration

Onboard LAN1 Controller

Use this setting to enabled or disabled the Onboard LAN1 boot (Enabled).

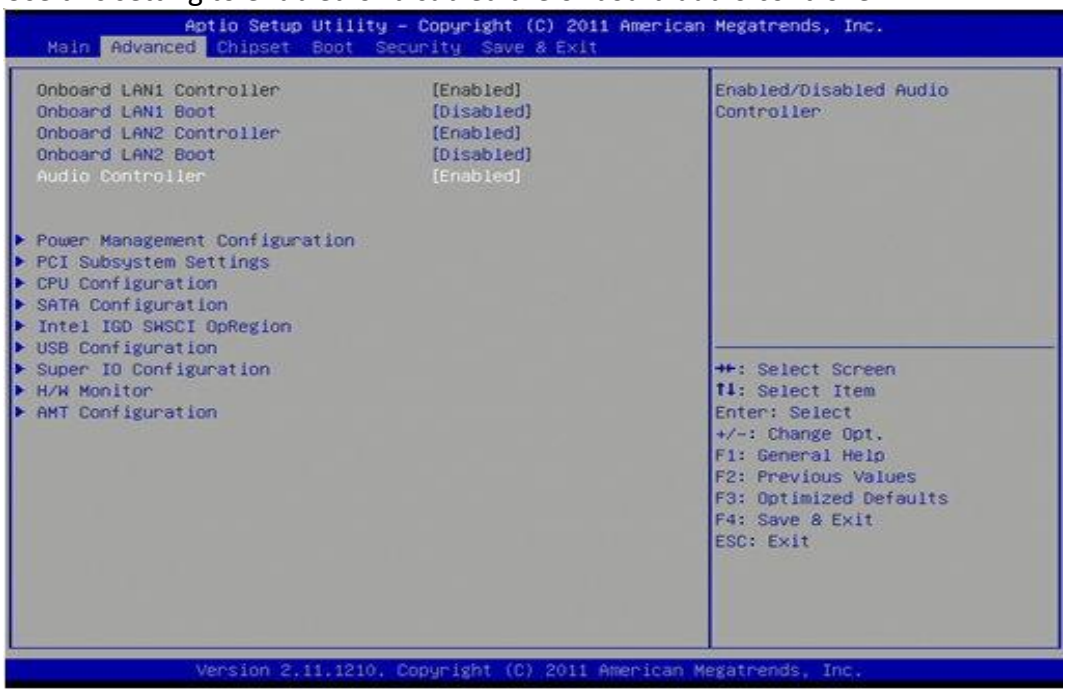


Onboard LAN2 Controller

Use this setting to enabled or disabled the onboard LAN2 (Enabled).

Audio Controller

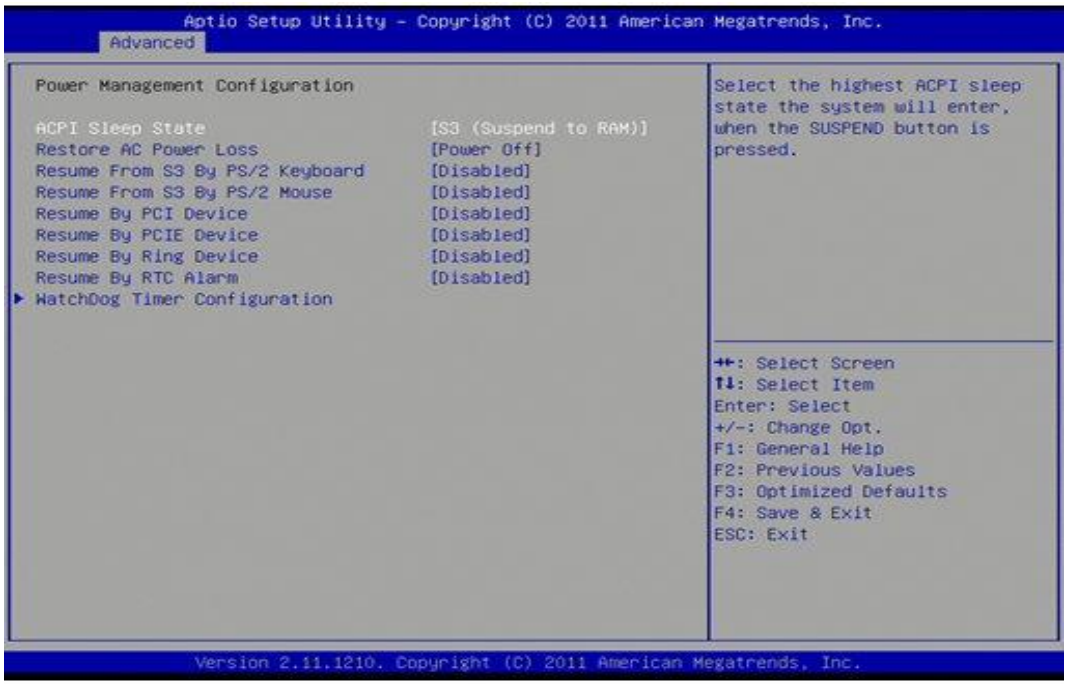
Use this setting to enabled or disabled the onboard audio controller.



Power Management Configuration

ACPI Sleep State

The Advanced Configuration and Power Interface (ACPI) specification provides an open standard for device configuration and power management by the operating system.
ACPI defines platform-independent interfaces for hardware discovery, configuration, power management and monitoring. Power Management settings are configurable.



The menu displays the highest ACPI sleep state when the system enters suspend. The following ACPI sleep p states are available:

- G0 (S0): Working
- G1, Sleeping (four states S1 through S4):
  - S1: All processor caches are flushed and the CPU(s) stops executing instructions. Power to the CPU(s) and RAM is maintained; devices that do not indicate they must remain on may be powered down.
  - S2: CPU powered off
  - S3: Commonly referred to as Standby, Sleep, or Suspend to RAM. RAM remains powered
  - S4: Hibernation or Suspend to Disk. All content of main memory is saved to non-volatile memory such as a hard drive, and is powered down.
- G2 (S5), Soft Off: G2 is similar to G3 Mechanical Off setting, but some components remain powered so the computer can "wake" from designated keyboard, clock, modem, LAN, or USB device input.
- G3, Mechanical Off (Default): The computer's power consumption approaches close to zero to the point that the power cord can be removed and the system is safe for disassembly (typically, only the real-time clock is running off its own small battery).

A Legacy state is also defined for operating systems not supporting ACPI functionality. ACPI is disabled in this state.

Restore AC Power Loss

This menu specifies what state to go to when power is re-applied after a power failure (Power Off).

Resume from S3 By PS/2 Keyboard

Select this option to enable or disable the PS/2 Keyboard wake up function from S3 mode (Disabled).

Resume from S3 By PS/2 Mouse

Select this option to disable or enable the PS/2 Mouse wake up function from S3 mode (Disabled).

Resume By PCI Device

Select this option to disable or enable the PCI device wake up function (Disabled).

Resume By PCIE Device

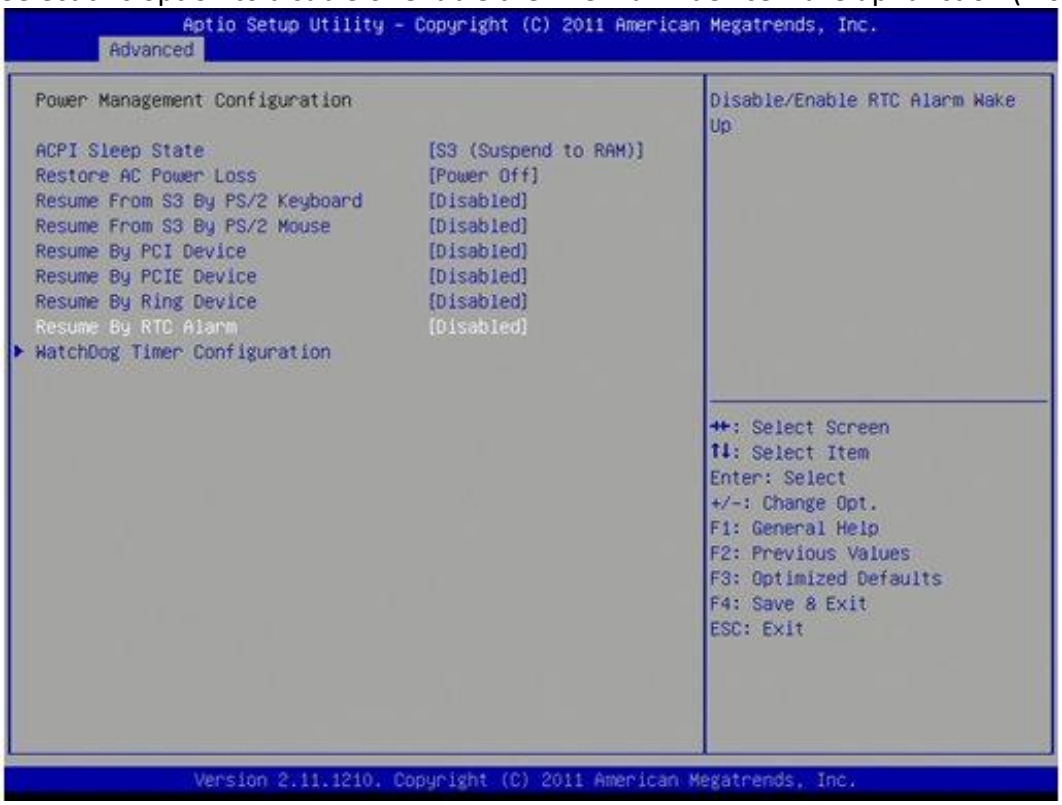
Select this option to disable or enable the PCIe device wake up function (Disabled).

Resume By Ring Device

Select this option to disable or enable the Ring device wake up function (Disabled).

Resume By RTC Alarm

Select this option to disable or enable the RTC Alarm device wake up function (Disabled).



WatchDog Timer Configuration

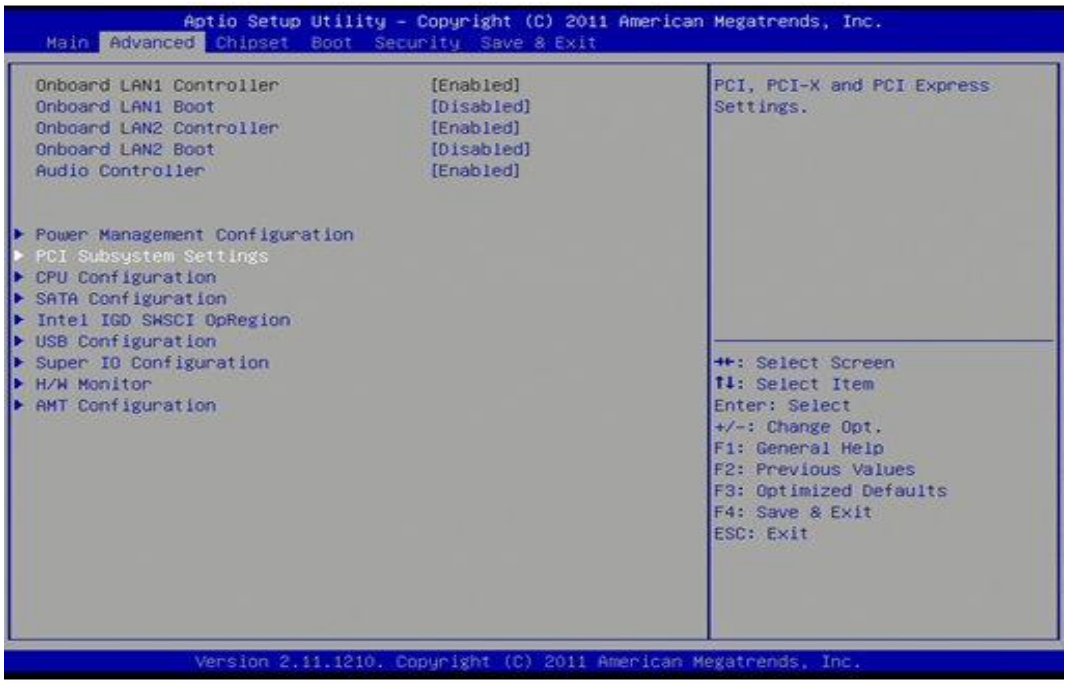
Select this option to enable or disable the timer countdown for the WatchDog Timer Function (Disabled).

WDT Function

Select this option to enable or disable the WDT Function (Disabled).

PCI Subsystem Settings

Select this option to set the PCI Sybsystem Settings parameters.



The device and vendor IDs are displayed. 16-bit vendor IDs is allocated by the PCI-SIG. Features and error reporting are supported by the status register. Features that can be enabled or disabled are supported by the command register. The Cache Line Size (system dependent) register must be programmed before the device can use the memory-write-and-invalidate transaction.

PCI ROM Priority

Select this option to set the ROM priority (Legacy or EFI Compatible)

PCI Latency Timer

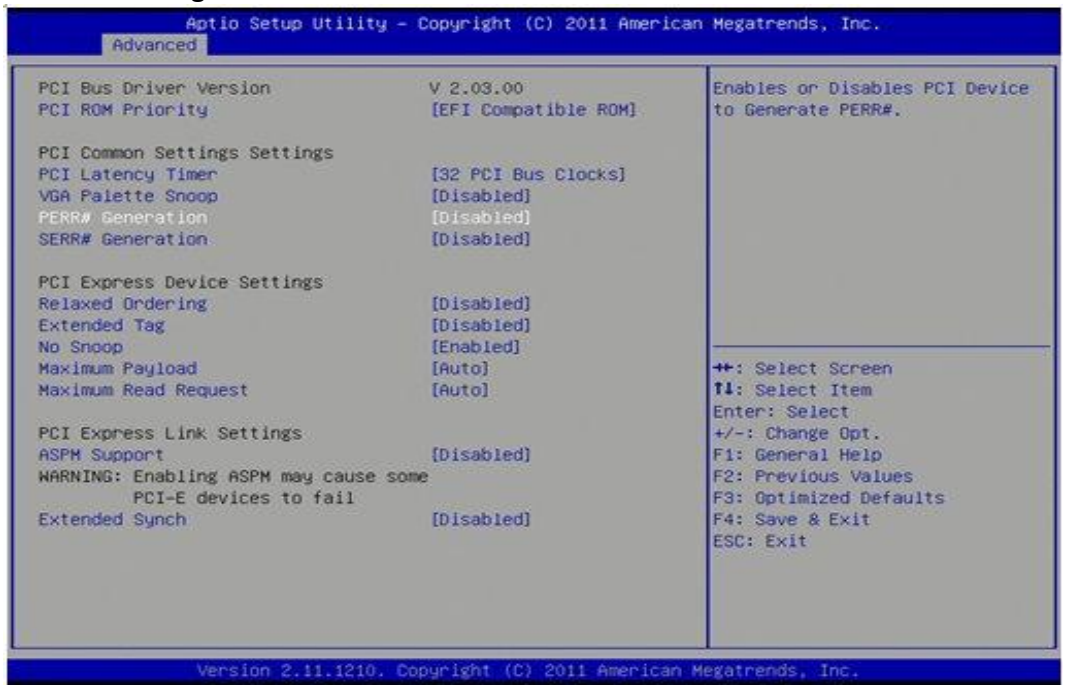
Select this option to set the PCI bus clock. Devices that operate in bus-master mode require a timer to limit the use of the PCI bus. This allows the use of the PCI bus by various devices. Setting a latency timer too low interrupts transfers unnecessarily, while setting a timer too high may cause a buffer overflow (devices requiring frequent bus access).

VGA Palette Snoop

Select this option to enable or disable the VGA palette snoop (Disabled). The VGA Palette Snoop enables PCI cards without a VGA color palette to examine and mimic the video card palette. This feature is required for some MPEG decoder cards, TV cards, and other expansion cards that deal with graphics.

PERR# Generation

Select this option to enable or disable PERR# function (Default). When enabled the function allows PCI devices to generate PERR numbers.



SERR# Generation

Select this option to enable or disable SERR# function (Default). When enabled the function allows PCI devices to generate SERR numbers.

PCIe devices Relaxed Ordering

Select this option to enable or disable the Relaxed Ordering function (Default). When enabled the function allow PCI's delayed transaction protocol to allow transactions to complete out of order.

PCIe Devices Extended Tag

Select this option to enable or disable the Extended Tag function (Disabled). When enabled the extended tag setting allows existing PCIe device to provide active (D0) device power management sub-state.

PCIe Devices No Snoop

Select this option to enable or disable the No Snoop function (Enabled).

PCIE 'Enable No Snoop' bit is set by default per PCIE spec, he the operating system assumes the PCI DMA is snooped—legacy PCI devices.

PCIe Devices Maximum Payload

Select this option to set the Maximum Payload function (Auto).The maximum payload size defined by the PCI Express protocol and connected to send up to 4096 bytes.

PCIe Devices Maximum Request

Select this option to set the Maximum Read Request function (Auto).This setting determines the largest read request any PCI Express device can generate. Reducing the maximum read request size reduces the hogging effect of any device.

PCI Express Link Setting(ASPM Support)

Select this option to enable or disable the ASPM support function (Disabled). The PCI Express ASPM defines a protocol for PCI Express components in D0 state to reduce link power.

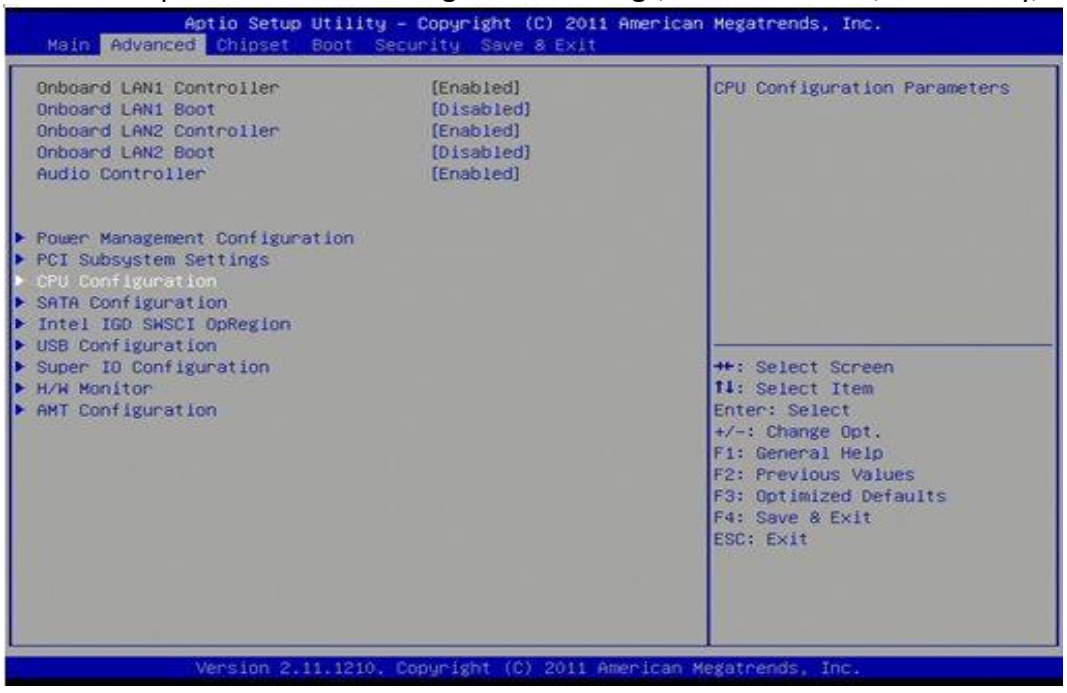
Note: It is recommended to use only PCIE cards supporting ASPM.

PCI Express Link Setting(Extended Synchronization patterns)

Select this option to enable or disable the Extended Synchronization function (Disabled).If this setting is enabled, the system allows generation of extended synchronization patterns.

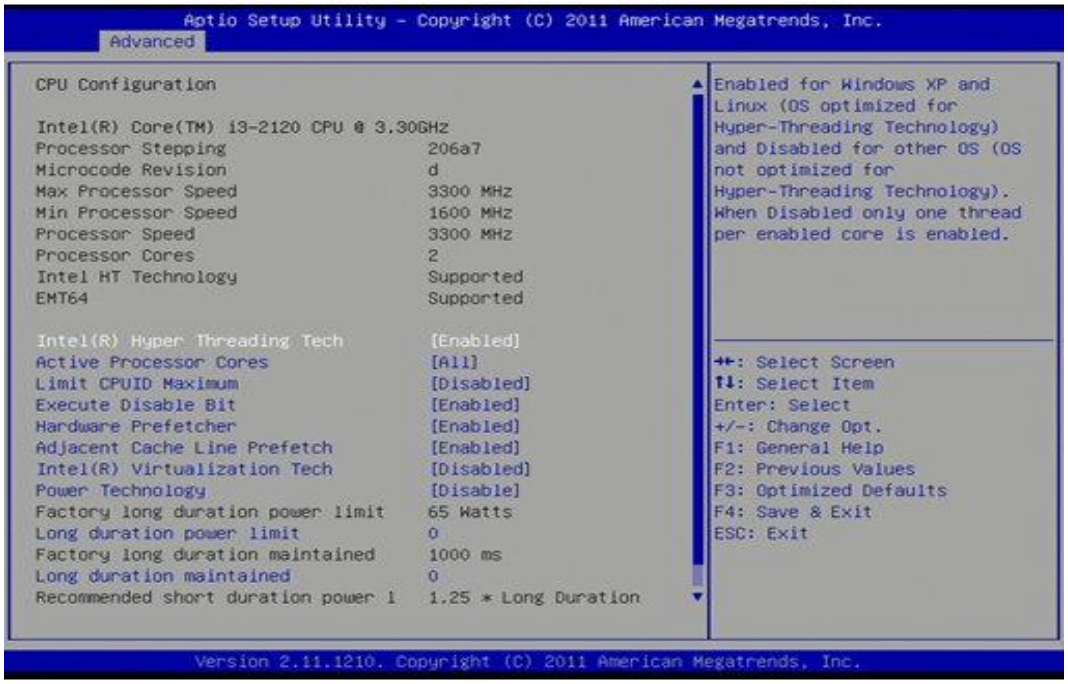
CPU Configuration

Select this option to set CPU configuration settings, such as: CPU ID, CPU Family, and Clock Speed.



Intel Hyper Threading Tech

Select this option to enable or disable the Intel Hyper Threading technology (Enabled).

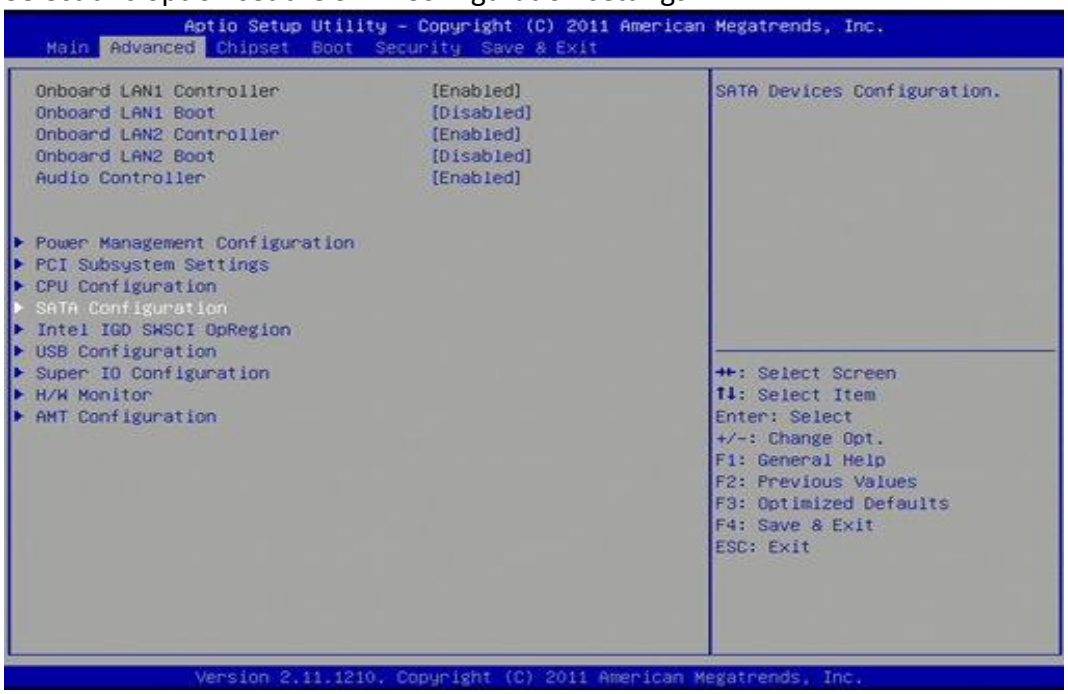


Hyper-threading technology, (HTT) is Intel's term for its simultaneous multithreading implementation in some of its CPUs.

Hyper-threading is an Intel-proprietary technology used to improve performance of multiple tasks running simultaneously. For each processor core that is physically present, the operating system addresses two virtual processors, and divides the workload. Hyper-threading requires system support for multiple processors and HTT optimization. It is recommended disabling HTT when using operating systems that have not been optimized for this chip feature.

SATA Configuration

Select this option set the SATA Configuration settings.



SATA Mode on IDE Mode

Select this option to set the SATA Mode function. The following options are available: RAID, AHCI and IDE modes.

Serial-ATA Controller 0

Select this option to set the Serial-ATA Controller 0 function (Disabled).
The following settings are available: Disabled, Enhanced, or Compatible.

Serial-ATA Controller 1

Select this option to set the Serial-ATA Controller 1 function (Enhanced). The following settings are available: Disabled or Enhanced.

Intel IGD SWSCI OpRegion

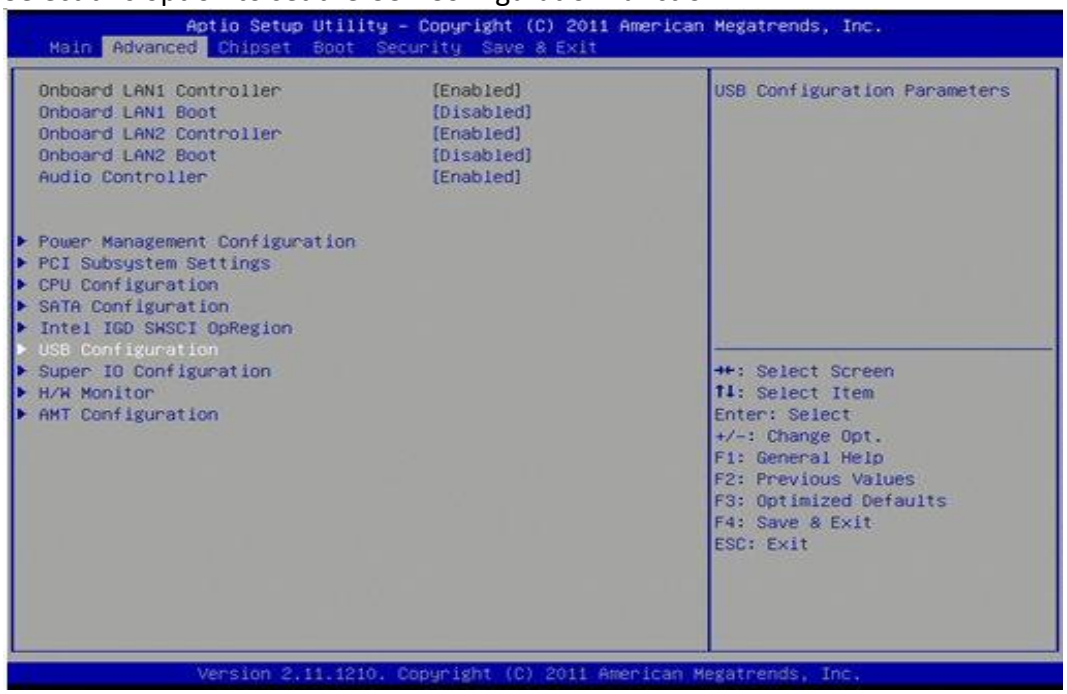
Select this option to set the Intel integrated graphics device (IGD) SWSCI OpRegion function (Disabled).

DVMT Mode Select

Select this option to set the DVMT Mode (DVMT Mode). The following settings are available: Fixed Mode, DVMT Mode or Combo Mode.

USB Configuration

Select this option to set the USB Configuration function.



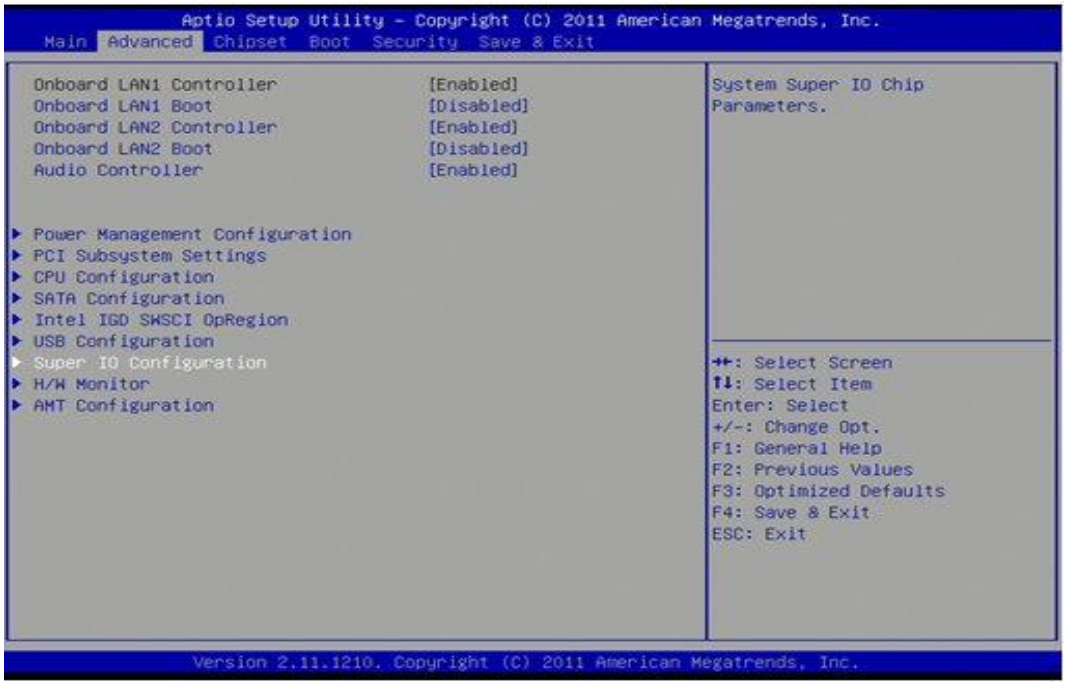
Legacy USB Support

Select this option to set the Legacy USB Support function (Enabled).

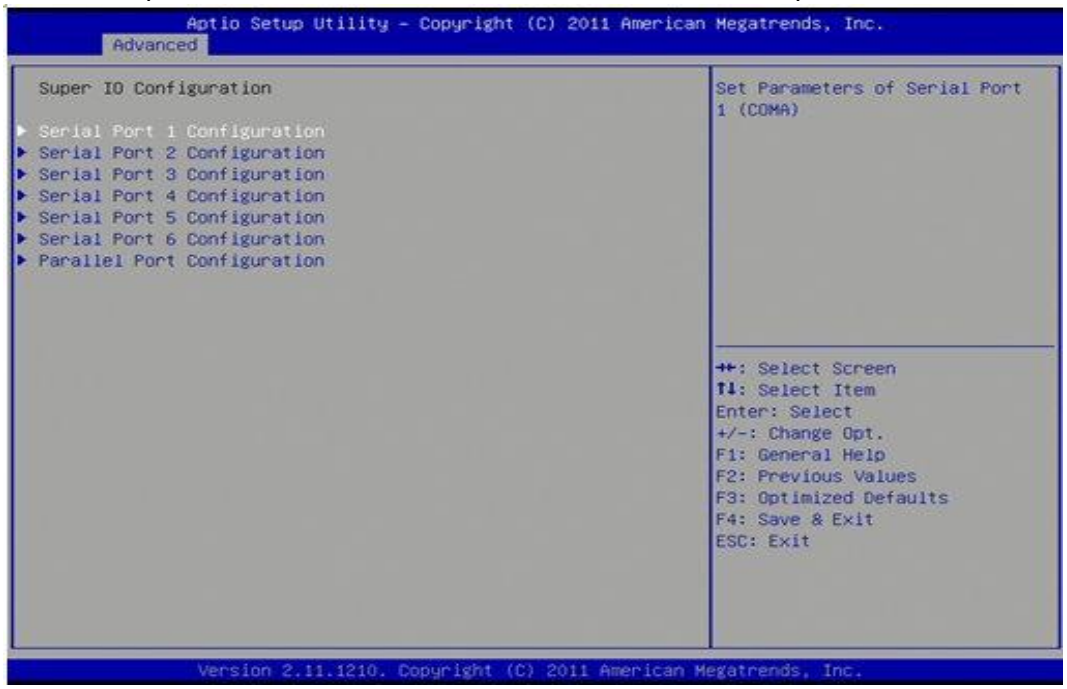
The Legacy USB Support determines if the BIOS should provide support for legacy USB devices.

Super I/O Configuration

Select this option to set the IO Configuration function for onboard serial ports.

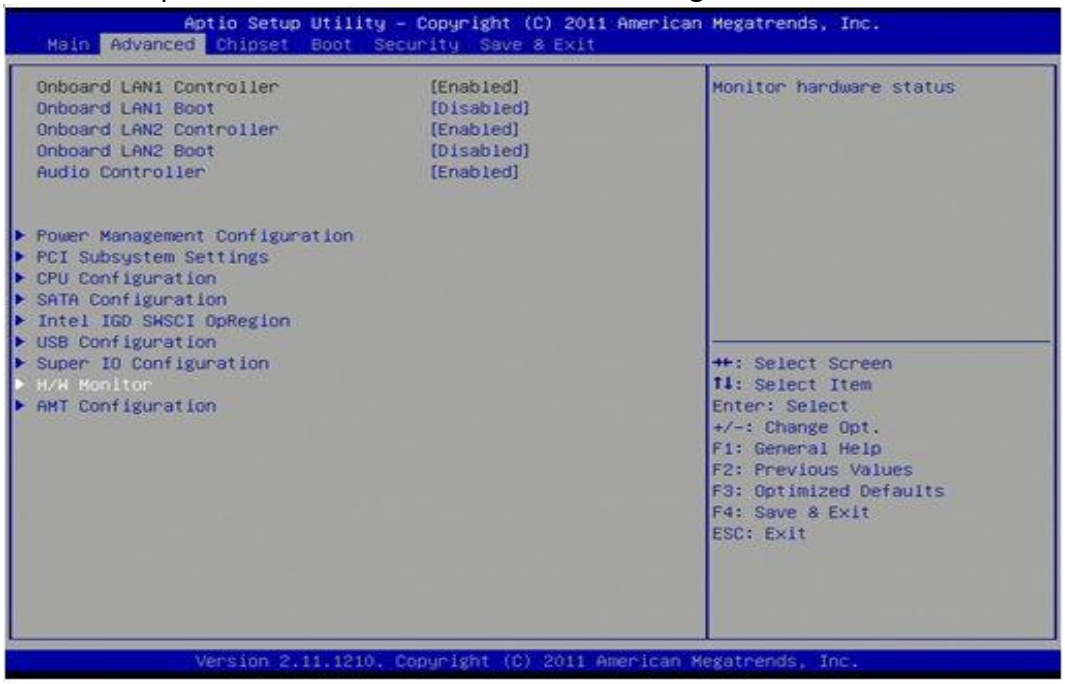


Select an option to set the Serial Port 1 to 6 and Parallel Port parameters.



H/W Monitor

Select this option to set the Hardware Monitor settings.

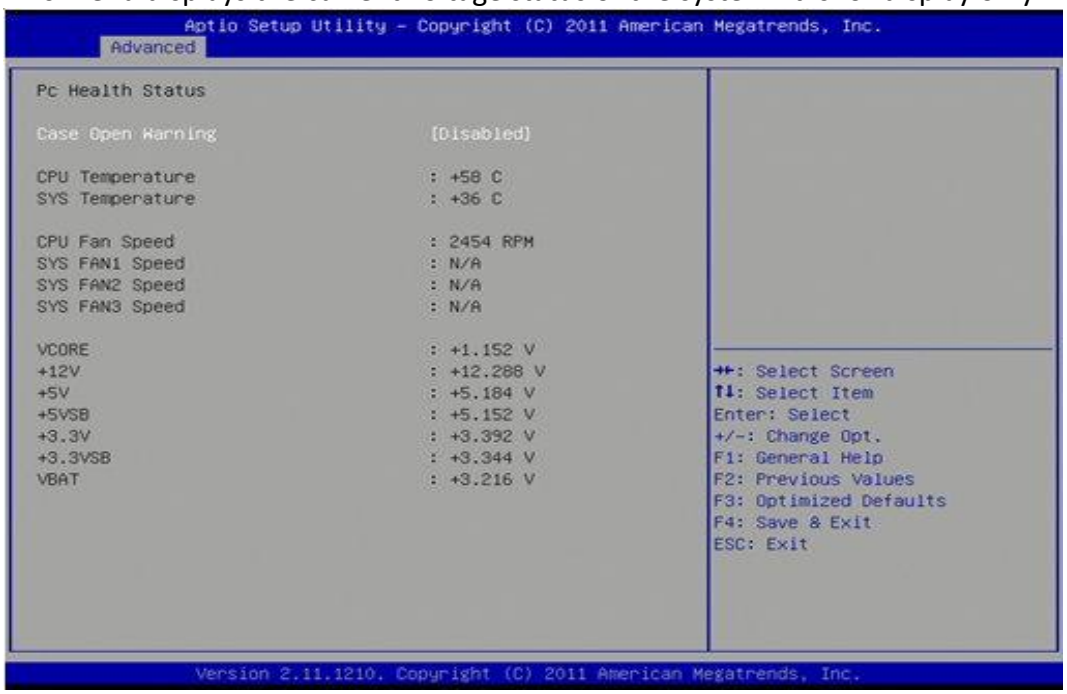


The Hardware Monitor reads out all accessible hardware sensors. Depending on the type of available sensors, the following data can be accessed:

- Temperature readings at different locations
- Battery data of portable computers
- Voltage sensors
- Current (amperage) sensors
- Fan speed sensors
- Sensors for pulse-width controlled fans
- Power and load sensors
- Ambient light sensors
- User-defined artificial sensors to monitor the operating system

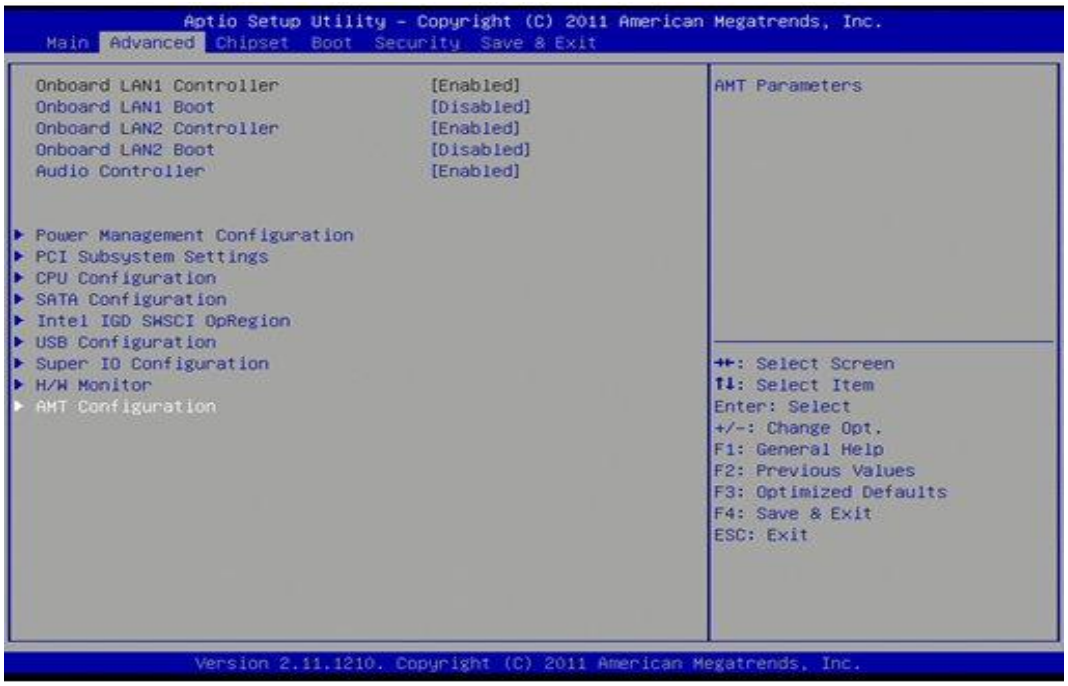
PC Health Status

This menu displays the current voltage status of the system. It is for display only.



Intel AMT Configuration

Select this option to set the AMI Configuration settings.



AMT is intended for use with software management applications. It gives a management application (and thus, the system administrator who uses it) better access to the PC in order to remotely and securely run tasks that are difficult or sometimes impossible when working on a PC that does not have built-in remote functionalities.

Intel AMT Configuration

Select this option to set the AMT Configuration settings.

4.5 The Chipset Menu

Select this option to configure the North Chipset and other parameters.

North Bridge

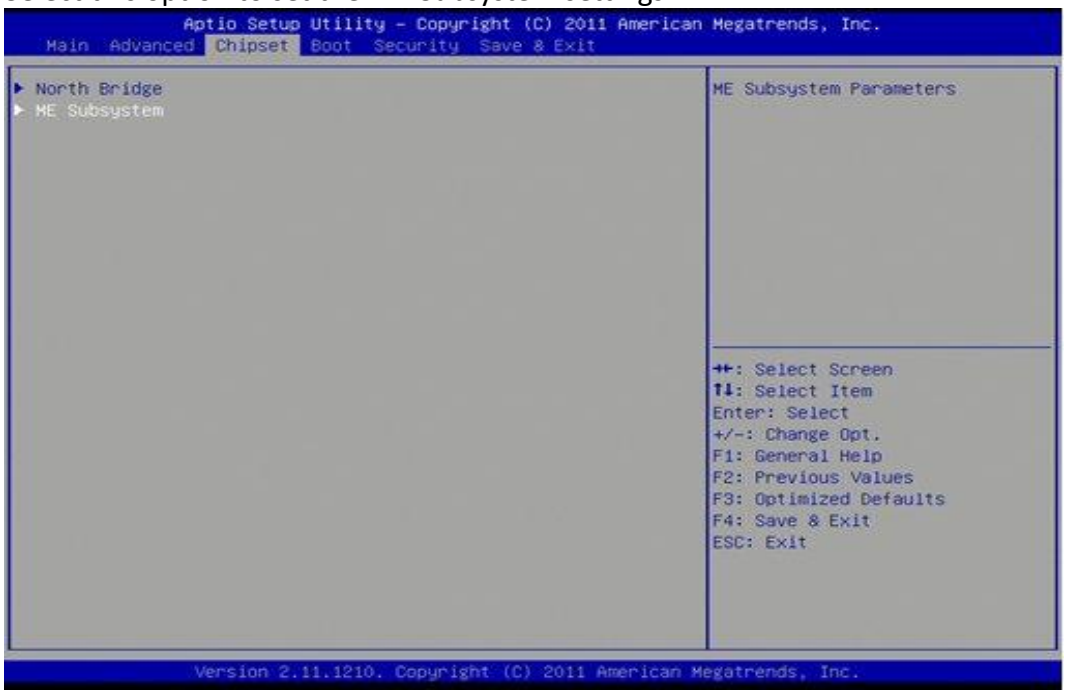
Low MMIO Align

Select an option to configure. The following settings are available:
Low MMIO Align (1024MB): select to set this parameter.
DMI Gen2 (Enabled): select to enable or disable this parameter.
VT-d settings (Disabled): select to enable or disable this parameter.
Initiate Graphic Adapter (PEG/IGO): select to enable or disable this parameter.
IGD Memory (64M): select to enable or disable this parameter.
Render Standby (Enabled): select to enable or disable this parameter.
PCI Express Port (Auto): select to configure this parameter.
PEG Force Gen1 (Disabled): select to enable or disable this parameter.
Detect Non-Compliance Device (Disabled): select to enable or disable this parameter.
MRC Message Print (Disabled): select to enable or disable this parameter.

Note: The Low MMIO resources align at 64MB/1024MB (Default: 1024MB).

ME Subsystem

Select this option to set the ME Subsystem settings.



Intel ME Subsystem Configuration

Select an option to configure. The following settings are available:

ME Subsystem (Enabled): select to enable or disable this parameter.
ME Temporary Disable (Disabled): select to enable or disable this parameter.
End of Post Message (Enabled: select to enable or disable this parameter.

Note: A boot cycle does not change the function (Enabled/Disabled) status.
Note: Disabling the controller may unintentionally affect the functionality of the ME subsystem.

Integrated Clock Chip Configuration

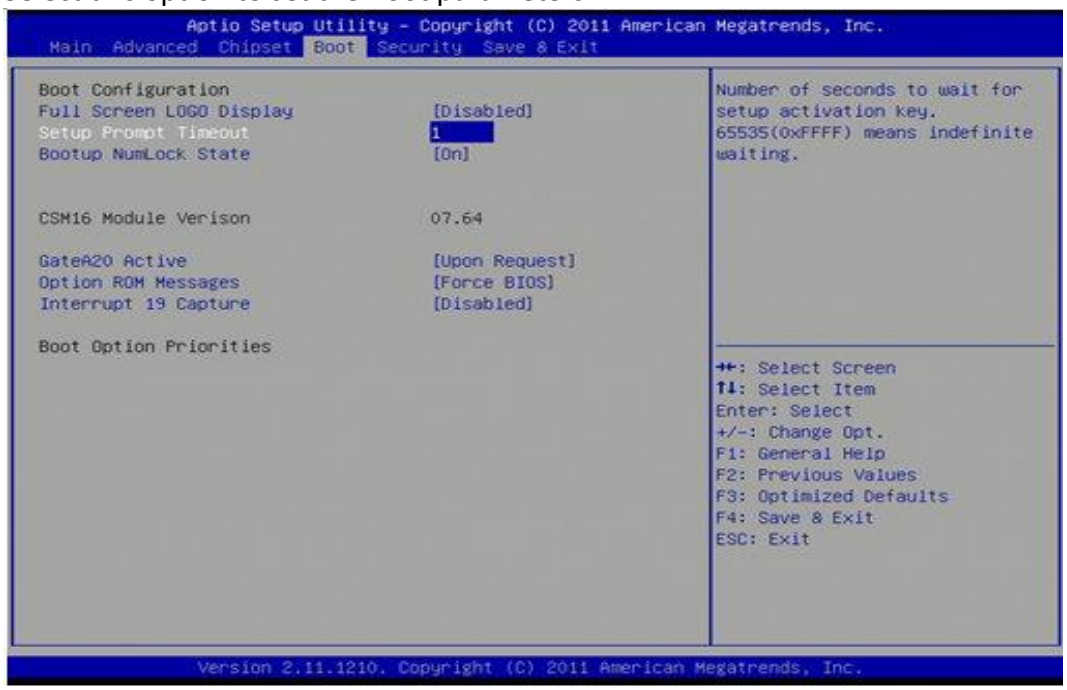
Select this option to set the Integrated Clock Chip Configuration parameters.
The Integrated Clock Chip Configuration menu can be accessed to set the overclocking profiles on the BIOS. Performance Tuning can be accessed to adjust the settings in the CPU Configuration and Chipset Configuration submenus. In Turbo mode, the IA Core Current, the TDP, the EIST and Turbo mode can be controlled. The Chipset menu controls the memory timings and graphics configuration.

Integrated Clock Chip Configuration(ICC Enabled)

Select this option to enable or disable the ICC Enable parameter (Disabled).

4.6 Boot Menu

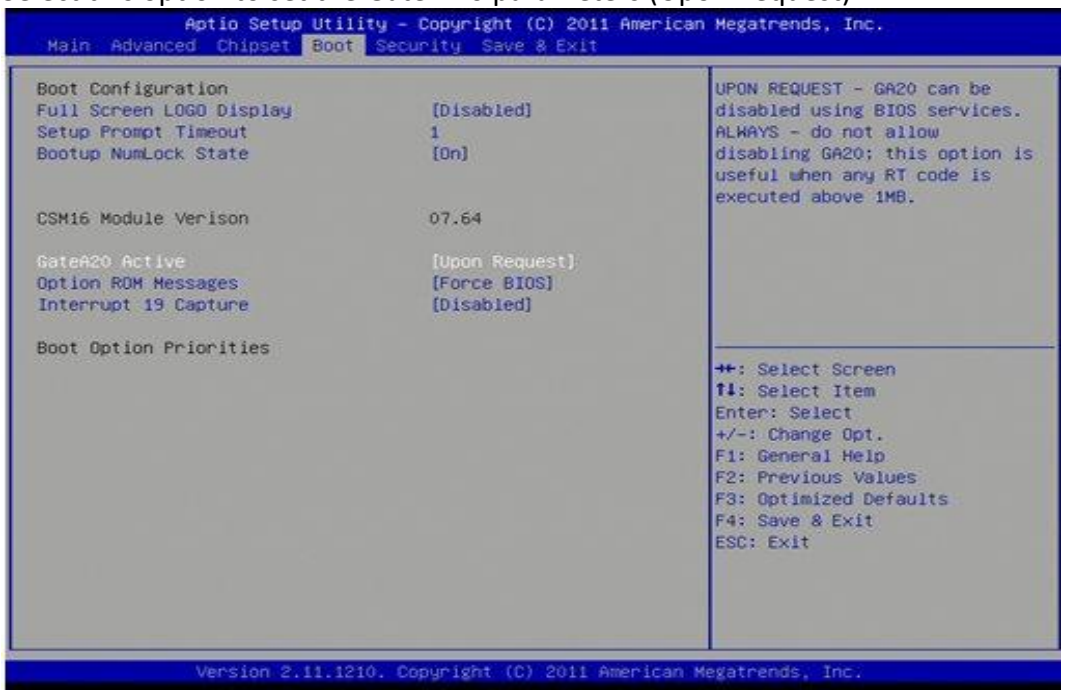
Select this option to set the Boot parameters.



The following settings are available: Full Screen LOGO Display (Disabled): select to enable or disable this parameter.
Setup Prompt Timeout: select to set this parameter.
Bootup NumLock State (On): select to turn on or off this parameter.
CSM16Module Version: displays the version number of the CSM module.

Gate A20 Active

Select this option to set the Gate A20 parameters (Upon Request).



Option ROM Messages

Select this option to set the Option ROM Messages parameters (Force BIOS).

Interrupt 19 Capture

Select this option to set the Interrupt 19 Capture parameters (Disabled).

4.7 Security Menu

Select this option to set the Security parameters.

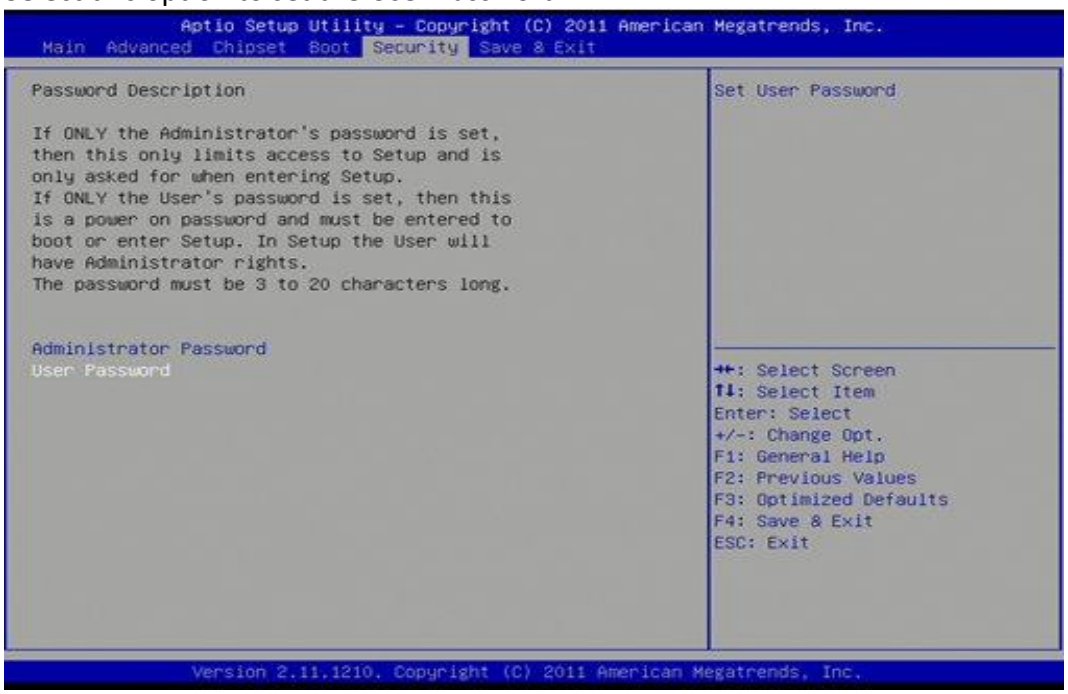
Select an option to configure. The following settings are available:
Administrator Password: Select to set the administrator password.
User Password: Select to set the user password.

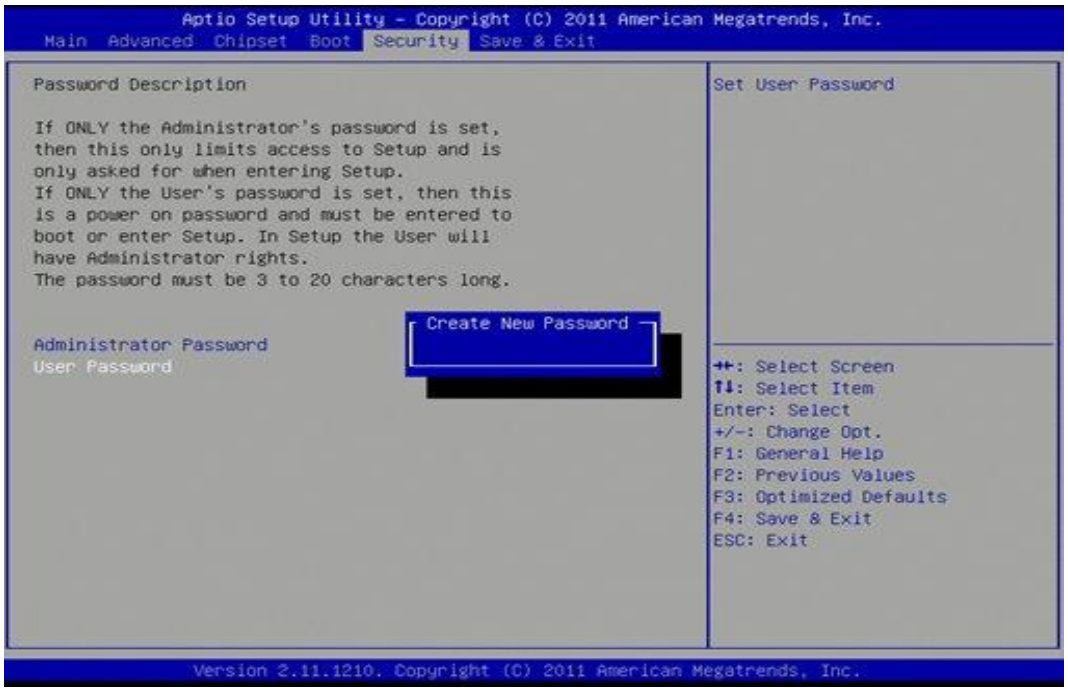
Administrator Password

Select this option to set the Administrator Password parameters.

User Password

Select this option to set the User Password.





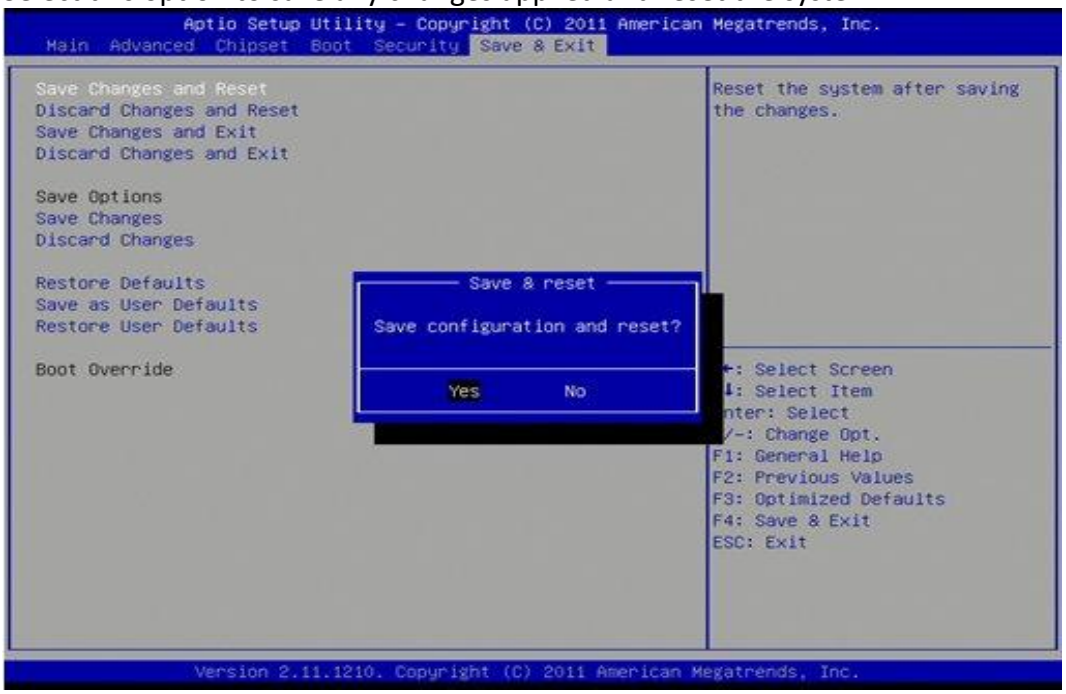
4.7 Save & Exit Menu

Select this option to set the Save & Exit parameters.

The following settings are available:
Save Changes and Reset: Select to set this parameter.
Discard Changes and Reset: Select to set this parameter.
Save Changes and Exit: Select to set this parameter.
Discard Changes and Exit: Select to set this parameter.
Save Options: Select to set this parameter.
Save Changes: Select to set this parameter.
Discard Changes: Select to set this parameter.
Restore Defaults: Select to set this parameter.
Save as User Defaults: Select to set this parameter.
Restore User Defaults: Select to set this parameter.

Save Change and Reset

Select this option to save any changes applied and reset the system.

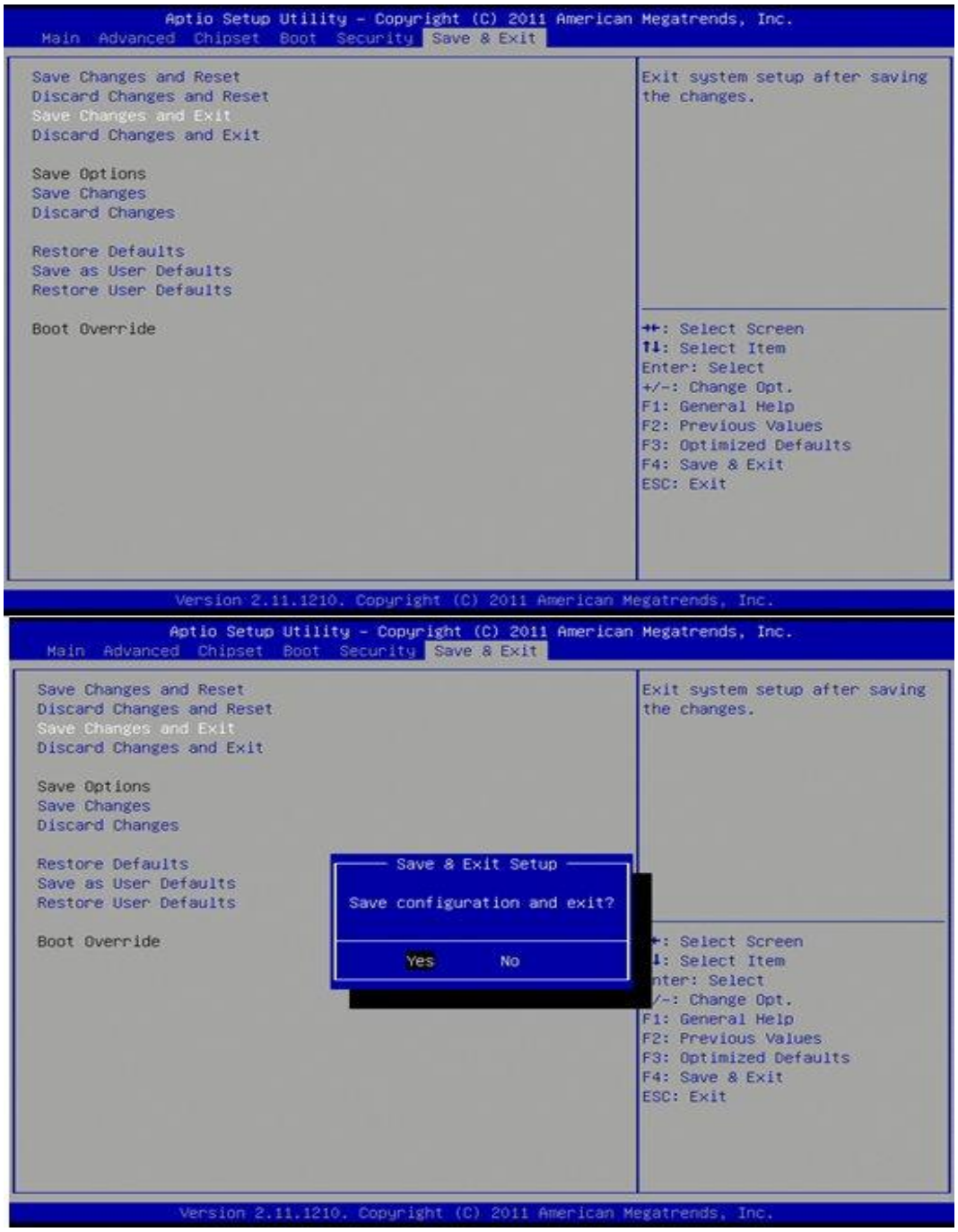


Discard Changes and Reset

Select this option to discard any changes applied and reset the system.

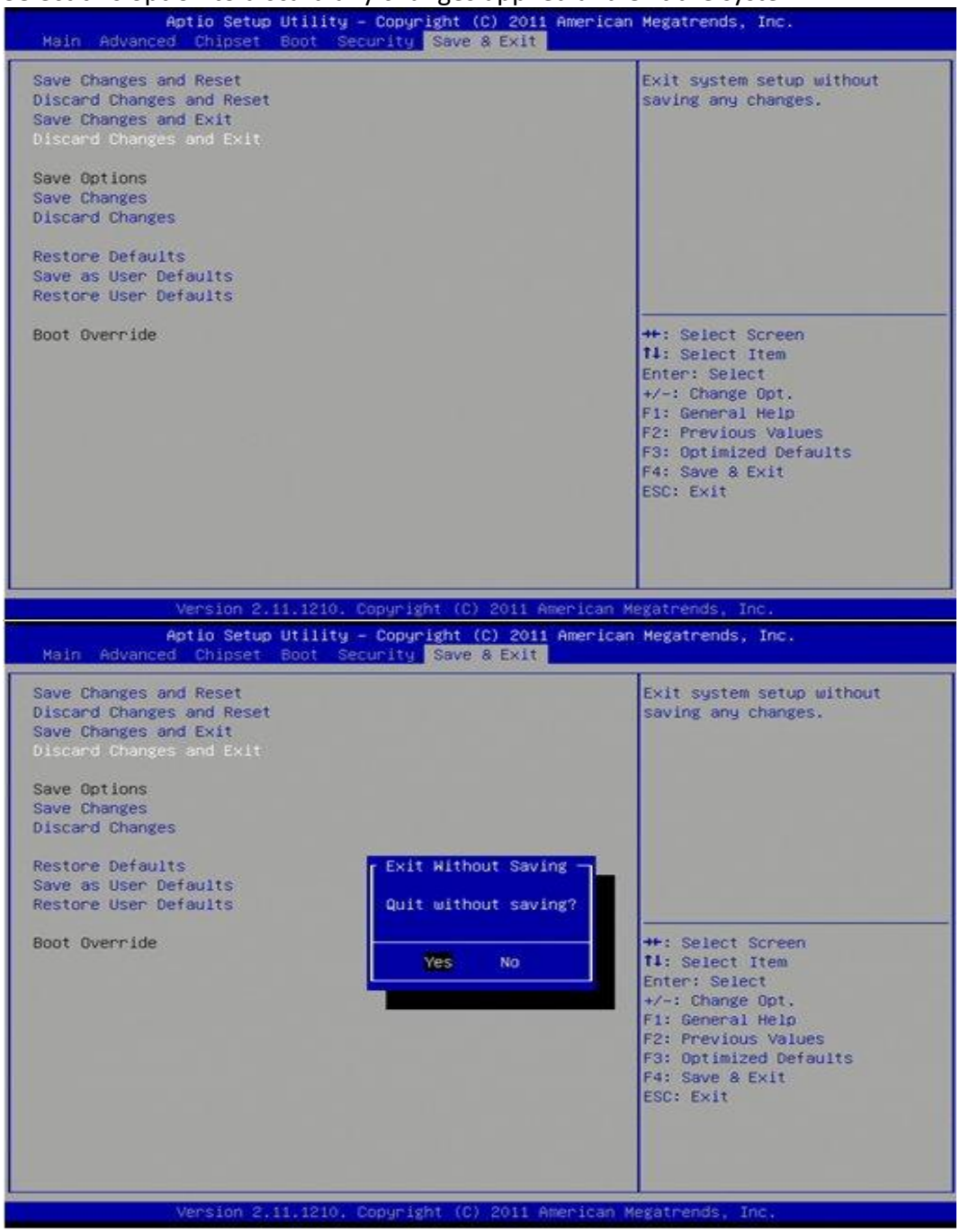
Save Changes and Exit

Select this option to save any changes applied and exit the system.



Discard Changes and Exit

Select this option to discard any changes applied and exit the system.



Save Changes

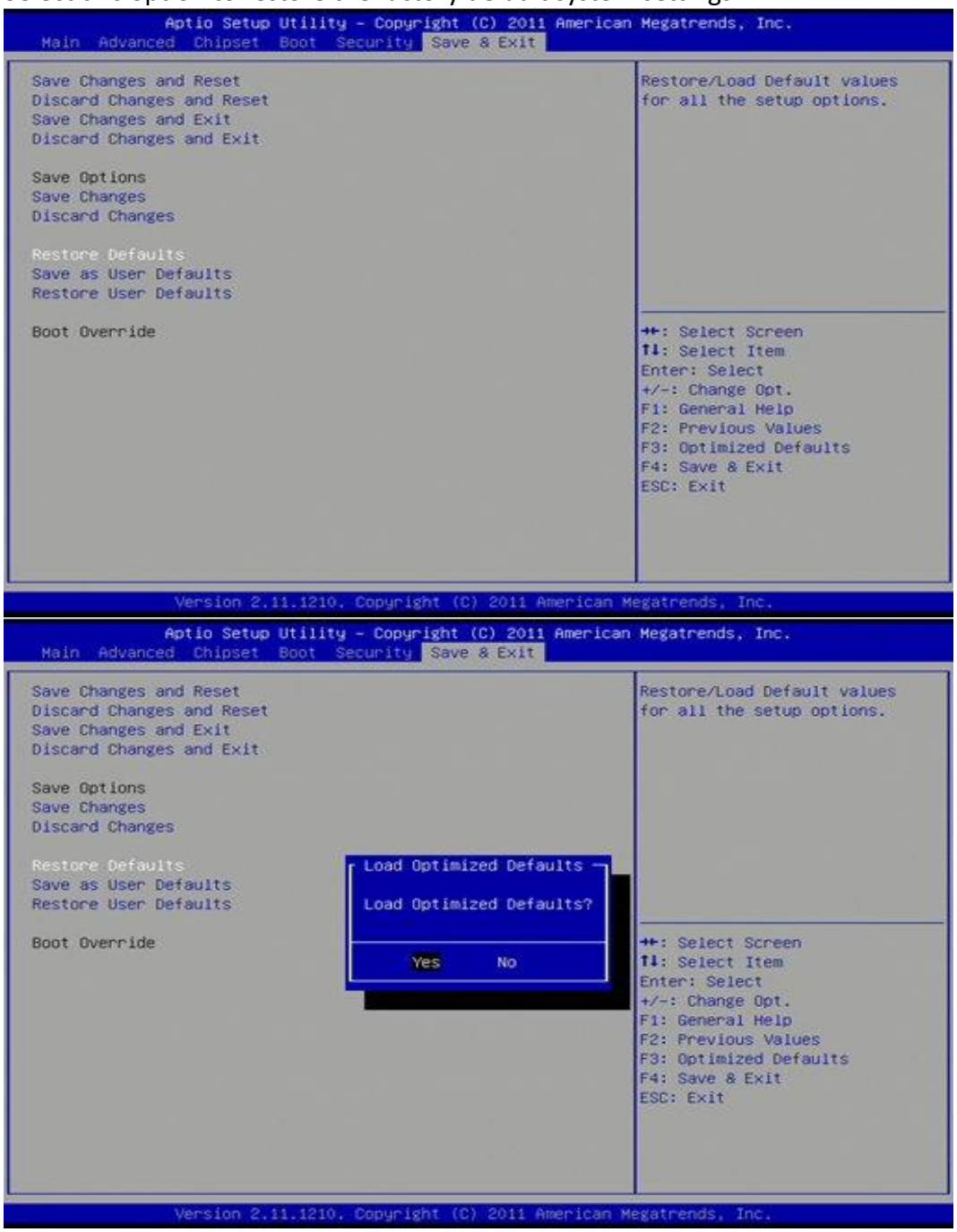
Select this option to save any changes applied.

Discard Changes

Select this option to discard any changes applied.

Restore Defaults

Select this option to restore the factory default system settings.



Save as User Defaults

Select this option to save any changes applied as user defaults.

Restore User Defaults

Select this option to restore the user default system settings.

APPENDIX A Watchdog Timer Setting

After the system stops working for a while, it can be auto-reset by the Watchdog Timer. The integrated Watchdog Timer can be set up in the system reset mode by program.

Using the Watchdog Function

Start

↓

Un-Lock WDT

:O 2E 87 ; Un-lock super I/O
O 2E 87 ; Un-lock super I/O

↓

Set WDT Function

O 2E 2D O 2F 20

Select Logic device

O 2E 07
O 2F 08

↓

Activate WDT

:O 2E 30
O 2F 01

Set Second or Minute

O 2E F5
O 2F N N=00 or 08(See below table)

↓

Set base timer

:O 2E F6
O 2F M=00,01,02,…FF(Hex),Value=0 to 255

↓

WDT counting

re-set timer :O 2E F6
O 2F M ; M=00,01,02,…FF(See the following table)
↓
IF No re-set timer :WDT time-out, generate RESET

IF to disable WDT :O 2E 30
O 2F 00 ; Can be disable at any time

N=00
M= 00h: Time-out Disable
01h: Time-out occurs after 1 second
02h: Time-out occurs after 2 second
03h: Time-out occurs after 3 second
……
FFh: Time-out occurs after 255 second

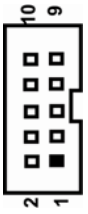
N=08
M= 00h: Time-out Disable
01h: Time-out occurs after 1 minute
02h: Time-out occurs after 2 minutes
03h: Time-out occurs after 3 minutes
……
FFh: Time-out occurs after 255 minutes

APPENDIX B DIGITAL I/O

Digital I/O Software Programming

Program Example: 4IN/4OUT (W83627DHG)

GPI	GPO
O 2E 87	O 2E 87
O 2E 87	O 2E 87
O 2E 07	O 2E 07
O 2F 09	O 2F 09
O 2E 30	O 2E 30
O 2F 02	O 2F F2
O 2E F0	O 2E F0
O 2F F0	O 2F F0
O 2E F1	O 2E F1
I 2F	O 2F M(Note)



Pin	Signal	Pin	Signal
1	DI1	2	DO1
3	DI2	4	DO2
5	DI3	6	DO3
7	DI4	8	DO4
9	GND	10	GND