S7070

Version 1.0b

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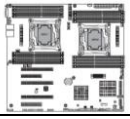
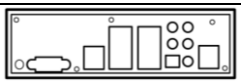
Contents

Before you begin…

Check the box contents!

The retail motherboard package should contain the following:

	1 x S7070 Motherboard
	2 x SATA Single Cable
	1 x Rear IO shielding
	1 x S7070 Quick Installation Guide
	1 x TYAN® Driver CD

IMPORTANT NOTE:
Sales samples may not come with any of the accessories listed above.
If you have ordered a sales sample and you are missing any of the above items, please contact your sales representative to help order accessories.

Chapter 1: Instruction

1.1 Congratulations

You have purchased the powerful TYAN® S7070 motherboard, based on the Intel® C612 Wellsburg chipset. The S7070 is designed to support dual Intel® Xeon E5-2600 v3 (Haswell-EP) Series processors, and up to 32GB RDIMM, 64GB LRDIMM and 128GB LRDIMM 3DS* DDR4 memory for each DIMM slot. Leveraging advanced technology from Intel®, the S7070 is capable of offering scalable 32 and 64-bit computing, high-bandwidth memory design, and lightning-fast PCI-E bus implementation.

The S7070 not only empowers you in today's demanding IT environment but also offers a smooth path for future application upgradeability. All of these rich feature sets provide the S7070 with the power and flexibility to meet demanding requirements for today's IT environments.

Remember to visit the TYAN® website at **http://www.tyan.com**. There you can find all the information on all TYAN® products as well as all the supporting documentation, FAQs, Drivers and BIOS upgrades.

1.2 Hardware Specifications

TYAN S7070 (S7070WGM2NR)

Processor	**Supported CPU Series**	Intel Xeon Processor E5-2600 v3 series
	Socket Type / Q'ty	Socket-R3 (LGA2011) / (2)
	Thermal Design Power (TDP) wattage	Max up to 160W
	System Bus	Up to 9.6/ 8.0/ 6.4 GT/s with Intel QuickPath Interconnect (QPI) support
Chipset	**PCH**	Intel C612
Memory	**Supported DIMM Qty**	(8)+(8) DIMM slots
	DIMM Type / Speed	RDIMM DDR4 2133/1866/1600 / LRDIMM DDR4 2133/1600 / LRDIMM 3DS DDR4 2133/1600
	Capacity	Up to 512GB RDIMM/ 1024GB LRDIMM/ 2048GB LRDIMM 3DS *Follow latest Intel DDR4 Memory POR
	Memory channel	4 Channels per CPU / 2 DIMM per channel
	Memory voltage	1.2V

Expansion Slots	**PCI-E**		PCI-E Slot1 Gen3 x8 from CPU1(Open-end) PCI-E Slot2 Gen3 x16 from CPU1 PCI-E Slot4 Gen3 x16 from CPU0 PCI-E Slot6 Gen3 x16 from CPU0
LAN	**Port Q'ty**		(2) GbE ports (1 port shared with IPMI)
	Controller		Intel I350-AM2
Storage	**SAS**	**Connector**	(2) Mini-SAS connectors (totally support 8 ports)
		Controller	LSI SAS2308
		Speed	6.0 Gb/s
		RAID	RAID 0/1/1E/10 (LSI Integrated RAID)
	SATA	**Connector**	(1) Mini-SAS,(2) SATA (totally support 6 ports)
		Controller	Intel C612
		Speed	6.0 Gb/s
		RAID	RAID 0/1/10/5 (Intel RST)
	SSATA	**Connector**	(4) SSATA + SGPIO2
		Controller	Intel C612
		Speed	6.0 Gb/s
		RAID	RAID 0/1/10/5 (Intel RST)
Graphic	**Connector type**		D-Sub 15-pin
	Resolution		Up to 1920x1200
	Chipset		Aspeed AST2400
Input /Output	**USB**		(4) USB3.0 ports (2 at rear, 2 via cable) / (5) USB2.0 ports (2 at rear, 1 type A header, 2 via cable)
	COM		(1) header
	SAS		(2) Mini-SAS (4-in-1) connectors
	VGA		(1) D-Sub 15-pin VGA port
	RJ-45		Total (2) GbE ports, (1) shared with IPMI
	Power		SSI 24-pin + 8-pin + 8-pin + 4-pin power connector (4-pin power connector is option)
	SATA		(6) SATA + (4) SATA ports by (1) mini-SAS connector
System Monitoring	**Chipset**		Aspeed AST2400
	Voltage		Monitors voltage for CPU, memory, chipset & power supply
	Fan		Total (7) 4-pin headers / Total (1) 2 x 10-pin headers
	Temperature		Monitors temperature for CPU & memory & system environment

	LED	Over temperature warning indicator / Fan & PSU fail LED indicator
	Others	Watchdog timer support
Server Management	**Onboard Chipset**	Onboard Aspeed AST2400
	AST2400 IPMI Feature	IPMI 2.0 compliant baseboard management controller (BMC) / Supports storage over IP and remote platform-flash / USB 2.0 virtual hub
	AST2400 iKVM Feature	24-bit high quality video compression / 10/100 Mb/s MAC interface
BIOS	**Brand / ROM size**	AMI / 16MB
	Feature	User-configurable H/W monitoring / SMBIOS 2.7/PnP/Wake on LAN / PXE boot support / ACPI 3.0/ACPI sleeping states S4,S5
Physical Dimension	**Form Factor**	SSI EEB
	Board Dimension	12”x13” (305x330mm)
Operating System	**OS supported list**	Please refer to our Intel OS supported list.
Regulation	**FCC (DoC)**	Class A
	CE (DoC)	Yes
Operating Environment	**Operating Temp.**	10° C ~ 35° C (50° F~ 95° F)
	Non-operating Temp.	- 40° C ~ 70° C (-40° F ~ 158° F)
	In/Non-operating Humidity	90%, non-condensing at 35° C
RoHS	**RoHS 6/6 Compliant**	Yes
Package Contains	**Motherboard**	(1) S7070 Motherboard
	Manual	(1) Quick Installation Guide
	Installation CD	(1) TYAN installation CD

TYAN S7070 (S7070GM2NR)

Processor	**Supported CPU Series**	Intel Xeon Processor E5-2600 v3 series
	Socket Type / Q’ty	Socket-R3 (LGA2011) / (2)
	Thermal Design Power (TDP) wattage	Max up to 160W
	System Bus	Up to 9.6/ 8.0/ 6.4 GT/s with Intel QuickPath Interconnect (QPI) support
Chipset	**PCH**	Intel C612
Memory	**Supported DIMM Qty**	(8)+(8) DIMM slots
	DIMM Type / Speed	RDIMM DDR4 2133/1866/1600 / LRDIMM DDR4 2133/1600 / LRDIMM 3DS DDR4 2133/1600
	Capacity	Up to 256GB RDIMM/ 512GB LRDIMM/ 1,024GB LRDIMM 3DS *Follow latest Intel DDR4 Memory POR
	Memory channel	4 Channels per CPU/ 2 DIMM per channel
	Memory voltage	1.2V

Expansion Slots	**PCI-E**		PCI-E Slot1 Gen3 x8 from CPU1(Open-end) PCI-E Slot2 Gen3 x16 from CPU1 PCI-E Slot4 Gen3 x16 from CPU0 PCI-E Slot6 Gen3 x16 from CPU0
LAN	**Port Q'ty**		(2) GbE ports (1 port shared with IPMI)
	Controller		Intel I350-AM2
Storage	**SATA**	**Connector**	(1) Mini-SAS,(2) SATA (totally support 6 ports)
		Controller	Intel C612
		Speed	6.0 Gb/s
		RAID	RAID 0/1/10/5 (Intel RST)
	SSATA	**Connector**	(4) SSATA + SGPIO2
		Controller	Intel C612
		Speed	6.0 Gb/s
		RAID	RAID 0/1/10/5 (Intel RST)
Graphic	**Connector type**		D-Sub 15-pin
	Resolution		Up to 1920x1200
	Chipset		Aspeed AST2400
Input /Output	**USB**		(4) USB3.0 ports (2 at rear, 2 via cable) / (5) USB2.0 ports (2 at rear, 1 type A header, 2 via cable)
	COM		(1) header
	VGA		(1) D-Sub 15-pin VGA port
	RJ-45		Total (2) GbE ports, (1) shared with IPMI
	Power		SSI 24-pin + 8-pin + 8-pin + 4-pin power connector(4-pin power connector is option)
	SATA		(6) SATA + (4) SATA ports by (1) mini-SAS connector
System Monitoring	**Chipset**		Aspeed AST2400
	Voltage		Monitors voltage for CPU, memory, chipset & power supply
	Fan		Total (7) 4-pin headers / Total (1) 2 x 10-pin headers
	Temperature		Monitors temperature for CPU & memory& system environment
	LED		Over temperature warning indicator / Fan & PSU fail LED indicator
	Others		Watchdog timer support
Server Management	**Onboard Chipset**		Onboard Aspeed AST2400
	AST2400 IPMI Feature		IPMI 2.0 compliant baseboard management controller (BMC) / Supports storage over IP and remote platform-flash / USB 2.0 virtual hub
	AST2400 iKVM Feature		24-bit high quality video compression / 10/100 Mb/s MAC interface
BIOS	**Brand / ROM size**		AMI / 16MB

	Feature	User-configurable H/W monitoring / SMBIOS 2.7/PnP/Wake on LAN / PXE boot support / ACPI 3.0/ACPI sleeping states S4,S5
Physical Dimension	**Form Factor**	SSI EEB
	Board Dimension	12”x13” (305x330mm)
Operating System	**OS supported list**	Please refer to our Intel OS supported list.
Regulation	**FCC (DoC)**	Class A
	CE (DoC)	Yes
Operating Environment	**Operating Temp.**	10° C ~ 35° C (50° F~ 95° F)
	Non-operating Temp.	- 40° C ~ 70° C (-40° F ~ 158° F)
	In/Non-operating Humidity	90%, non-condensing at 35° C
RoHS	**RoHS 6/6 Compliant**	Yes
Package Contains	**Motherboard**	(1) S7070 Motherboard
	Manual	(1) Quick Installation Guide
	Installation CD	(1) TYAN installation CD

TYAN S7070 (S7070WA2NR)

Processor	**Supported CPU Series**	Intel Xeon Processor E5-2600 v3 series
	Socket Type / Q’ty	Socket-R3 (LGA2011) / (2)
	Thermal Design Power (TDP) wattage	Max up to 160W
	System Bus	Up to 9.6/ 8.0/ 6.4 GT/s with Intel QuickPath Interconnect (QPI) support
Chipset	**PCH**	Intel C612
Memory	**Supported DIMM Qty**	(8)+(8) DIMM slots
	DIMM Type / Speed	RDIMM DDR4 2133/1866/1600 / LRDIMM DDR4 2133/1600 / LRDIMM 3DS DDR4 2133/1600
	Capacity	Up to 256GB RDIMM/ 512GB LRDIMM/ 1,024GB LRDIMM 3DS *Follow latest Intel DDR4 Memory POR
	Memory channel	4 Channels per CPU / 2 DIMM per channel
	Memory voltage	1.2V
Expansion Slots	**PCI-E**	PCI-E Slot1 Gen3 x8 from CPU1(Open-end) PCI-E Slot2 Gen3 x16 from CPU1 PCI-E Slot4 Gen3 x16 from CPU0 PCI-E Slot6 Gen3 x16 from CPU0
LAN	**Port Q’ty**	(2) GbE ports
	Controller	Intel I350-AM2

Storage	**SAS**	**Connector**	(2) Mini-SAS connectors (totally support 8 ports)
		Controller	LSI SAS2308
		Speed	6.0 Gb/s
		RAID	RAID 0/1/1E/10 (LSI Integrated RAID)
	SATA	**Connector**	(1) Mini-SAS,(2) SATA (totally support 6 ports)
		Controller	Intel C612
		Speed	6.0 Gb/s
		RAID	RAID 0/1/10/5 (Intel RST)
	SSATA	**Connector**	(4) SSATA + SGPIO2
		Controller	Intel C612
		Speed	6.0 Gb/s
		RAID	RAID 0/1/10/5 (Intel RST)
Audio	**Chipset**		Realtek ALC892-GR
Input /Output	**USB**		(4) USB3.0 ports (2 at rear, 2 via cable) / (5) USB2.0 ports (2 at rear, 1 type A header, 2 via cable)
	COM		(1) header
	SAS		(2) Mini-SAS (4-in-1) connectors
	Audio		LINE_IN, LINE_OUT, MIC_IN, SURROUNT OUT,CEN/LFE OUT, S/PDIF OUT
	RJ-45		Total (2) GbE ports
	Power		SSI 24-pin + 8-pin + 8-pin + 4-pin power connector (4-pin power connector is option)
	SATA		(6) SATA + (4) SATA ports by (1) mini-SAS connector
System Monitoring	**Chipset**		NCT7904D
	Voltage		Monitors voltage for CPU, system, chipset & power supply
	Fan		Total (7) 4-pin headers / Total (1) 2 x 10-pin headers
	Temperature		Monitors temperature for CPU & system environment
	LED		Over temperature warning indicator / Fan & PSU fail LED indicator
	Others		Watchdog timer support
BIOS	**Brand / ROM size**		AMI / 16MB
	Feature		User-configurable H/W monitoring / SMBIOS 2.7/PnP/Wake on LAN / PXE boot support / ACPI 3.0/ACPI

		sleeping states S4,S5
Physical Dimension	**Form Factor**	SSI EEB
	Board Dimension	12”x13” (305x330mm)
Operating System	**OS supported list**	Please refer to our Intel OS supported list.
Regulation	**FCC (DoC)**	Class A
	CE (DoC)	Yes
Operating Environment	**Operating Temp.**	10° C ~ 35° C (50° F~ 95° F)
	Non-operating Temp.	- 40° C ~ 70° C (-40° F ~ 158° F)
	In/Non-operating Humidity	90%, non-condensing at 35° C
RoHS	**RoHS 6/6 Compliant**	Yes
Package Contains	**Motherboard**	(1) S7070 Motherboard
	Manual	(1) Quick Installation Guide
	Installation CD	(1) TYAN installation CD

TYAN S7070 (S7070A2NR-B)

Processor	**Supported CPU Series**		Intel Xeon Processor E5-2600 v3 series
	Socket Type / Q’ty		Socket-R3 (LGA2011) / (2)
	Thermal Design Power (TDP) wattage		Max up to 160W
	System Bus		Up to 9.6/ 8.0/ 6.4 GT/s with Intel QuickPath Interconnect (QPI) support
Chipset	**PCH**		Intel C612
Memory	**Supported DIMM Qty**		(8)+(8) DIMM slots
	DIMM Type / Speed		RDIMM DDR4 2133/1866/1600 / LRDIMM DDR4 2133/1600 / LRDIMM 3DS DDR4 2133/1600
	Capacity		Up to 256GB RDIMM/ 512GB LRDIMM/ 1,024GB LRDIMM 3DS *Follow latest Intel DDR4 Memory POR
	Memory channel		4 Channels per CPU / 2 DIMM per channel
	Memory voltage		1.2V
Expansion Slots	**PCI-E**		PCI-E Slot1 Gen3 x8 from CPU1(Open-end) PCI-E Slot2 Gen3 x16 from CPU1 PCI-E Slot4 Gen3 x16 from CPU0 PCI-E Slot6 Gen3 x16 from CPU0
LAN	**Port Q’ty**		(2) GbE ports
	Controller		Intel I350-AM2
Storage	**SATA**	**Connector**	((1) Mini-SAS,(2) SATA (totally support 6 ports)
		Controller	Intel C612
		Speed	6.0 Gb/s
		RAID	RAID 0/1/10/5 (Intel RST)
	SSATA	**Connector**	(4) SSATA + SGPIO2
		Controller	Intel C612
		Speed	6.0 Gb/s

	RAID	RAID 0/1/10/5 (Intel RST)
Audio	**Chipset**	Realtek ALC892-GR
Input /Output	**USB**	(4) USB3.0 ports (2 at rear, 2 via cable) / (5) USB2.0 ports (2 at rear, 1 type A header, 2 via cable)
	COM	(1) header
	Audio	LINE_IN, LINE_OUT, MIC_IN, SURROUNT OUT,CEN/LFE OUT, S/PDIF OUT
	RJ-45	Total (2) GbE ports
	Power	SSI 24-pin + 8-pin + 8-pin + 4-pin power connector (4-pin power connector is option)
	SATA	(6) SATA+ (4) SATA ports by (1) mini-SAS connector
System Monitoring	**Chipset**	NCT7904D
	Voltage	Monitors voltage for CPU, memory, chipset & power supply
	Fan	Total (7) 4-pin headers / Total (1) 2 x 10-pin headers
	Temperature	Monitors temperature for CPU & system environment
	LED	Over temperature warning indicator / Fan & PSU fail LED indicator
	Others	Watchdog timer support
BIOS	**Brand / ROM size**	AMI / 16MB
	Feature	User-configurable H/W monitoring / SMBIOS 2.7/PnP/Wake on LAN / PXE boot support / ACPI 3.0/ACPI sleeping states S4,S5
Physical Dimension	**Form Factor**	SSI EEB
	Board Dimension	12”x13” (305x330mm)
Operating System	**OS supported list**	Please refer to our Intel OS supported list.
Regulation	**FCC (DoC)**	Class A
	CE (DoC)	Yes
Operating Environment	**Operating Temp.**	10° C ~ 35° C (50° F~ 95° F)
	Non-operating Temp.	- 40° C ~ 70° C (-40° F ~ 158° F)
	In/Non-operating Humidity	90%, non-condensing at 35° C
RoHS	**RoHS 6/6 Compliant**	Yes
Package Contains	**Motherboard**	(1) S7070 Motherboard
	Manual	(1) Quick Installation Guide
	Installation CD	(1) TYAN installation CD in bulk packing carton

S7070 SKU Comparison Table

	MB SKU	PCH SATA	NGFF ODM OEM	PCIE SLOT5 ODM OEM	PCIE SLOT6	LSI_SAS	BMC/VGA	AUDIO
S7070 Server SKU	S7070 WGM2NR/MB, R02	6+4	NO	NO	X16	LSI2308	AST2400	NO
	S7070 GM2NR/MB,R02	6+4	NO	NO	X16	NO	AST2400	NO
	S7070GM2NR-EFI-B/MB,R02	6+4	NO	X8	X8	NO	AST2400	NO
S7070 Workstation SKU	S7070WA2NR/MB, R02	6+4	NO	NO	X16	LSI2308	NO	ALC892
	S7070A2NR/MB, R02	6+4	NO	NO	X16	NO	NO	ALC892

1.3 Software Specifications

For the latest OS (operation system) support, please visit the Tyan's Web site for information.

Remember to visit our Web site at http://www.tyan.com for the latest AST2400 User's Guide.

Chapter 2: Board Installation

You are now ready to install your motherboard.

How to install our products right… the first time

The first thing you should do is read this user's manual. It contains important information that will make configuration and setup much easier. Here are some precautions you should take when installing your motherboard:

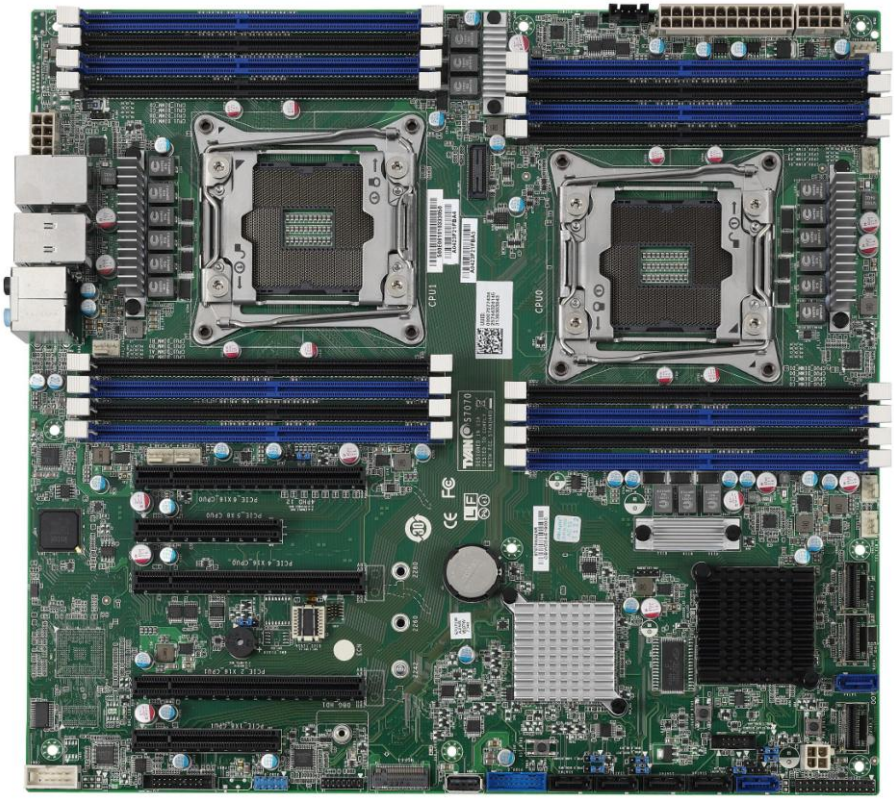
(1) Ground yourself properly before removing your motherboard from the antistatic bag. Unplug the power from your computer power supply and then touch a safely grounded object to release static charge (i.e. power supply case). For the safest conditions, MiTAC recommends wearing a static safety wrist strap.
(2) Hold the motherboard by its edges and do not touch the bottom of the board, or flex the board in any way.
(3) Avoid touching the motherboard components, IC chips, connectors, memory modules, and leads.
(4) Place the motherboard on a grounded antistatic surface or on the antistatic bag that the board was shipped in.
(5) Inspect the board for damage.

The following pages include details on how to install your motherboard into your chassis, as well as installing the processor, memory, disk drives and cables.

Caution!

1. To avoid damaging the motherboard and associated components, do not use torque force greater than 7kgf/cm (6.09 lb/in) on each mounting screw for motherboard installation.
2. Do not apply power to the board if it has been damaged.

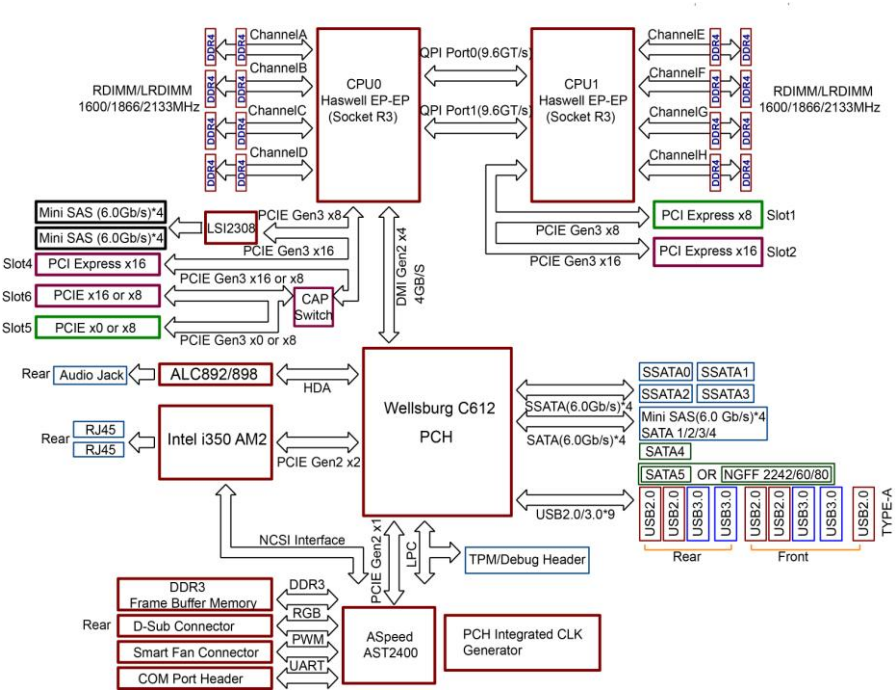
2.1 Board Image



S7070

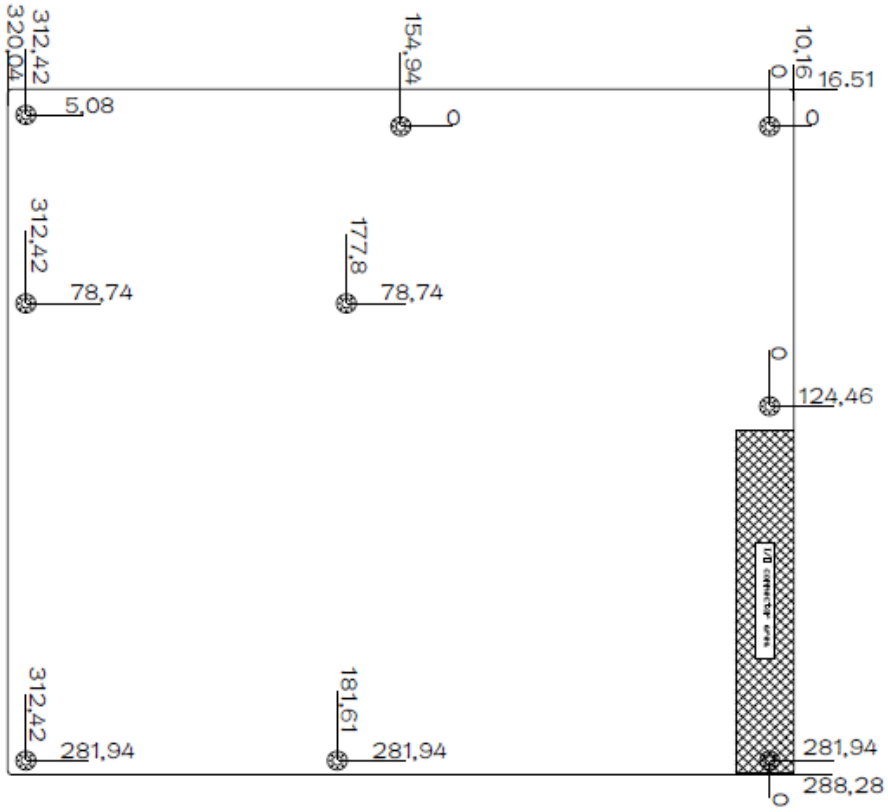
This picture is representative of the latest board revision available at the time of publishing. The board you receive may not look exactly like the above picture.
NOTE: The Slot#5 and M2 NGFF connector are not in SKU channel

2.2 Block Diagram

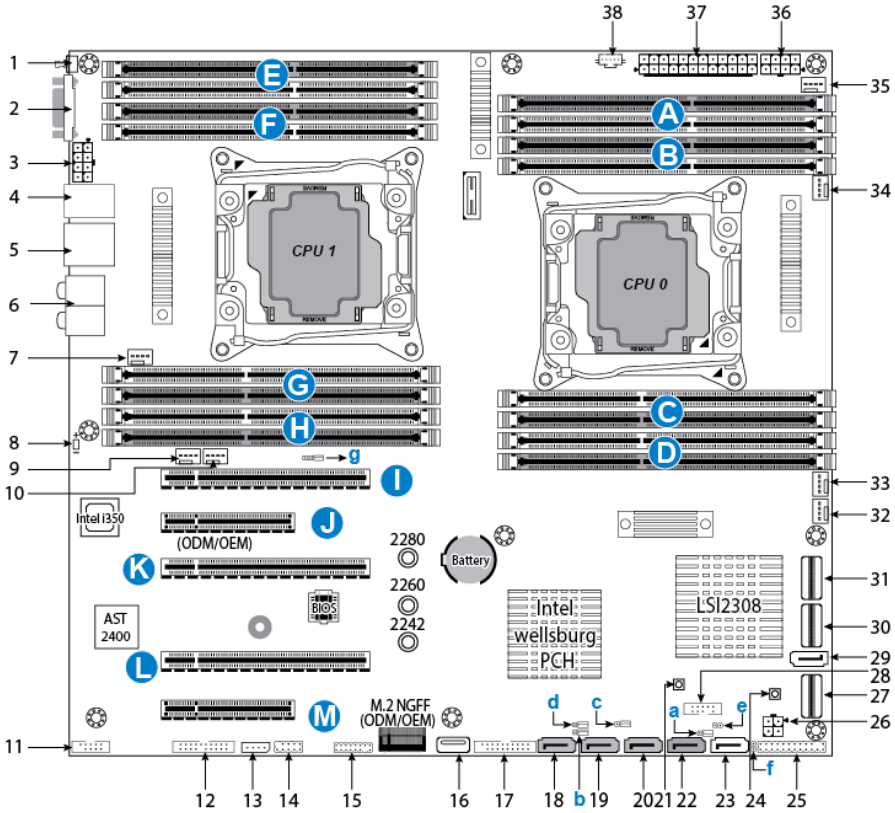


S7070 Block Diagram

2.3 Motherboard Mechanical Drawing



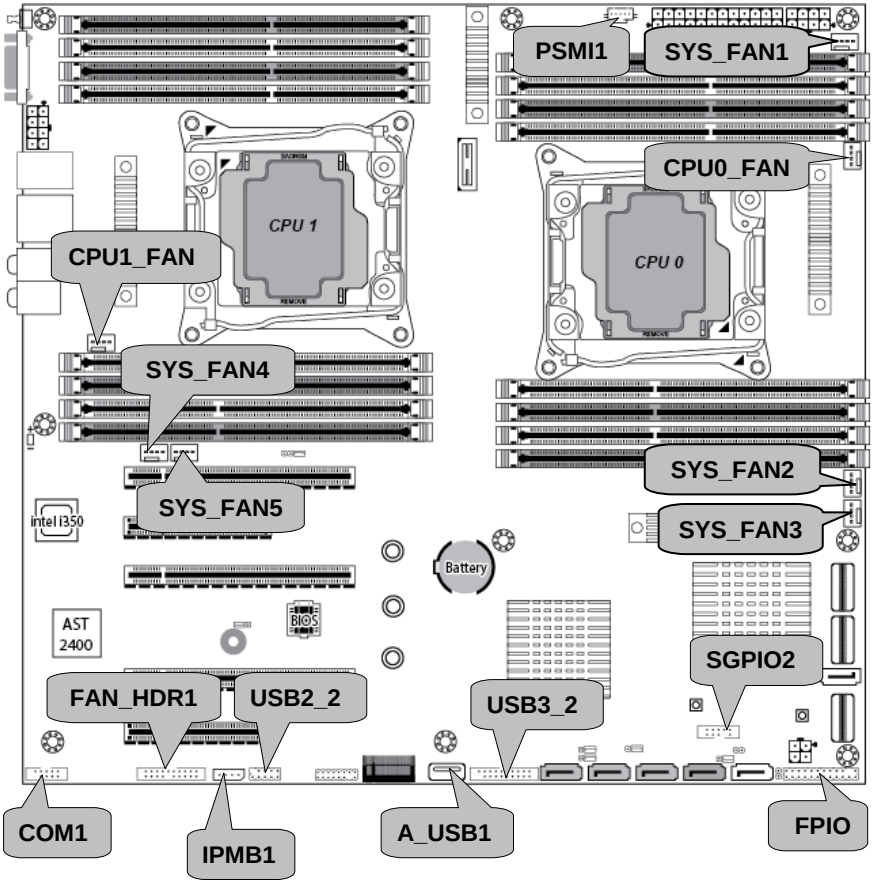
2.4 Board Parts, Jumpers and Connectors



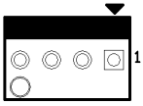
This diagram is representative of the latest board revision available at the time of publishing. The board you receive may not look exactly like the above diagram. The DIMM slot numbers shown above can be used as a reference when reviewing the DIMM population guidelines shown later in the manual. For the latest board revision, please visit our web site at **http://www.tyan.com.**

Motherboard Components

Connectors	
1. ID LED Button(SW1)	20. SSATA 3.0 Connector(SSATA1)
2. VGA Port	21. Clear CMOS Button
3. 8-pin Power Connector(PW3)	22. SSATA 3 0 Connector(SSATA0)
4. USB2.0 ports and LAN Port #2(LAN2)	23. SATA3.0 Connector(SATA5)
5. USB3.0 ports and LAN Port #1(LAN1)	24. Power Button
6. Audio Jack with S/PDIF	25. Front Panel Header(FPIO1)
7. 4-pin Fan Connector(CPU1_FAN)	26. 4-pin Power Connector (PW4)
8. ID LED	27. 4 in 1Mini SAS Connector(SATA0-3)
9. 4-pin Fan Connector (SYS_FAN5)	28. SGPIO Header(SGPIO2,SSATA0-3)
10. 4-pin Fan Connector (SYS_FAN4)	29. SATA3.0 Connector(SATA4)
11. COM Header (COM1)	30. 4 in 1 Mini SAS Connector(SAS4-7)
12. Front Fan Connector (FAN_HDR1)	31. 4 in 1 Mini SAS Connector(SAS0-3)
13. IPMB Connector (IPMB1)	32. 4-pin Fan Connector(SYS_FAN3)
14. Front 2.0 USB Header(USB2_2)	33. 4-pin Fan Connector(SYS_FAN2)
15. TYAN Module Header	34. 4-pin Fan Connector (CPU0_FAN)
16. TYPE_A USB Header(A_USB1)	35. 4-pin Fan Connector (SYS_FAN1)
17. Front 3.0 USB Header(USB3_2)	36. 8-pin Power Connector(PW2)
18. SSATA3.0 Connector(SSATA3)	37. 24-pin Power Connector(PW1)
19. SSATA3.0 Connector(SSATA2)	38. PSMI Connector
Memory Slots/PCIE Slots	
A.CPU0 DIMM A0/CPU0 DIMM A1	H.CPU1 DIMM A0/CPU1 DIMM A1
B.CPU0 DIMM B0/CPU0 DIMM B1	I.PCI-E G3x16 slot(x8 or x16 link) (f/CPU0)
C.CPU0 DIMM D0/CPU0 DIMM D1	J.PCI-E G3 x8 slot (x8 or x 0 link) (f/CPU0)
D.CPU0 DIMM C0/CPU0 DIMM C1	K.PCI-E G3 x16 slot (x16 link) (f/CPU0)
E.CPU1 DIMM C0/CPU1 DIMM C1	L.PCI-E G3x16 slot (x16 link) (f/CPU1)
F.CPU1 DIMM D0/CPU1 DIMM D1	M.PCI-E G3x8 slot (x8 link) (f/CPU1)
G.CPU1 DIMM B0/CPU1 DIMM B1	
Headers/Jumpers	
a. PSU_Alert Enable Jumper (3PHD_10)	e. Chassis Intrusion Header (2PHD_1)
b. Flash Security Override Jumper (3PHD_8)	f. ID_LED Button Header (2PHD_2)
c. ME Recovery Mode Jumper(3PHD_4)	g. Buzzer Disable Jumper(4PHD_12)
d. LAN2 Disable Jumper (3PHD_1)	h. Intel MIC Jumper (3PHD_2)


PSMI1
SYS_FAN1
CPU0_FAN
CPU 1
CPU 0
CPU1_FAN
SYS_FAN4
SYS_FAN2
SYS_FAN5
SYS_FAN3
intel i350
Battery
AST 2400
BIOS
SGPIO2
FAN_HDR1
USB2_2
USB3_2
COM1
IPMB1
A_USB1
FPIO

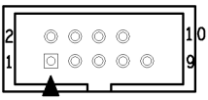
SYS_FAN1/2/3/4/5/CPU0/1_FAN: 4-Pin FAN Connector



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

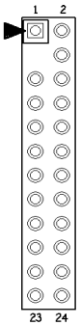
Use this header to connect the cooling fan to your motherboard to keep the system stable and reliable.
Note: A 4-pin fan is required for fan speed control.

COM1: COM Header



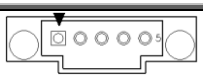
Signal	Pin	Pin	Signal
DCD	1	2	DSR
SIN	3	4	RTS
SOUT	5	6	CTS
DTR	7	8	RI
GND	9	10	KEY

FPIO: Front Panel Connector



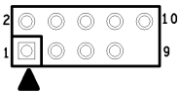
Signal	Pin	Pin	Signal
PWRLED+	1	2	V3P3_AUX
KEY	3	4	ID_LED+
PWRLED-	5	6	ID_LED-
HDDLED+	7	8	HWM_FAULT_LED-
HDDLED-	9	10	SYS_FAULT_LED-
PWR_SW#	11	12	LAN1_ACTLE+
GND	13	14	LAN1_ACTLED-
RST_SW#	15	16	SMBDATA
GND	17	18	SMBCLK
FP_IDLED_BTN_N	19	20	INTRUSION#
FPIO_TEMP_IN	21	22	LAN2_ACTLED+
NMI_SW#	23	24	LAN2_ACTLED-

PSIMI1: PSMI Connector



Pin	1	2	3	4	5
Signal	SMB_CLK	SMB_DAT	SMB_ALERT#	GND	V3P3

USB2_2: Front USB2.0 Header

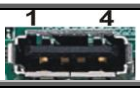


Signal	Pin	Pin	Signal
+5V	1	2	+5V
USB DATA1-	3	4	USB DATA2-
USBDATA1+	5	6	USB DATA2+
GND	7	8	GND
KEY	9	10	GND

USB3_2: Front USB3.0 Header

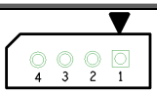
Signal	Pin	Pin	Signal
+5V	1	2	P0_RX_N
P0_RX_P	3	4	GND
P0_TX_N	5	6	P0_TX_P
GND	7	8	P0_N
P0_P	9	10	OC_N
P1_P	11	12	P1_N
GND	13	14	P1_TX_P
P1_TX_N	15	16	GND
P1_RX_P	17	18	P1_RX_N
+5V	19	20	Key

A_USB1: Vertical (Type_A) USB Connectors



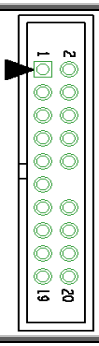
Pin	1	2	3	4
Signal	VCC	USBDATA2-	USBDATA2+	GND

IPMB1: IPMB Connector



Signal	Pin	Pin	Signal
BMC_SMB_DATA	1	2	GND
BMC_SMB_CLK	3	4	NC

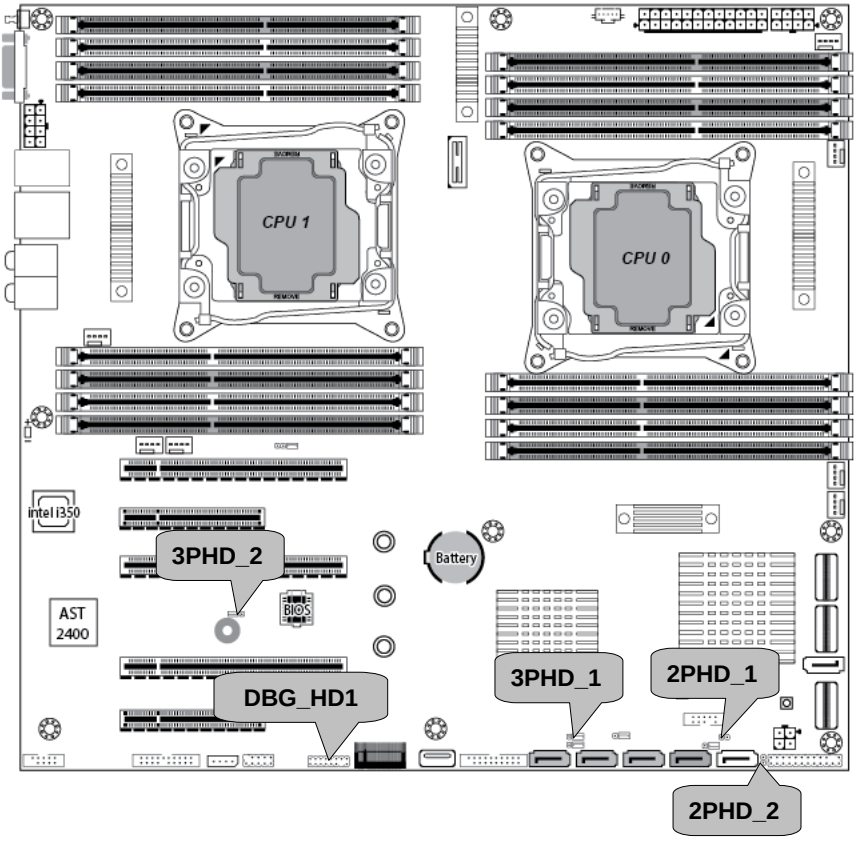
FAN_HDR1: Front Fan Connector (Reserved for Barebone)



Signal	Pin	Pin	Signal
TACH1	1	2	TACH6
TACH2	3	4	TACH7
TACH3	5	6	TACH8
TACH4	7	8	TACH9
TACH5	9	10	TACH10
GND	11	12	KEY
PWM2	13	14	PWM1
TACH11	15	16	SMB_DATA
TACH12	17	18	SMB_CLK
VCC3_AUX	19	20	PWM3

SGPIO2: SSATA SGPIO Header

Signal	Pin	Pin	Signal
SCL	1	2	NC
SDA	3	4	SSDATA OUT-
GND	5	6	SSLOAD
KEY	7	8	SSCLOCK
P3V3_AUX	9	10	HD_ERROR_LED
NOTE: SGPIO2 is responsible for SSATA 0~3			



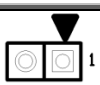
Caution:

1. The jumpers are only using for engineering debug. We don't suggest customers change the jumpers' position, which may cause unable to boot device.

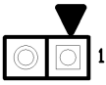
DBG_HD1: TYAN Module Header

Signal	Pin	Pin	Signal
P3V3	1	2	FRAME_N
LAD0	3	4	KEY
LAD1	5	6	PLT_RST_N
LAD2	7	8	GND
LAD3	9	10	CLK_33M
DBG_SERIRQ	11	12	GND
DBG_PRES_N	13	14	VCC3_AUX
ADDR_MB	15	16	PCH_PP_EN

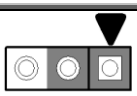
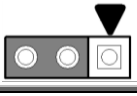
2PHD_1: Chassis Intrusion Header

 Open	**Pin**	**1**	**2**
	Signal	INTRUDER#	GND
 Short (**Default**)	Open: Use this header to **trigger** the system chassis intrusion alarm. Short: Use this header to **disable** the system chassis intrusion alarm.		

2PHD_2: ID LED Button Header

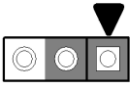
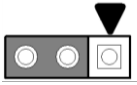
	**Pin**	**1**	**2**
	Signal	FP_IDLED_BTN_N	GND

3PHD_1: LAN2 Disable Jumper

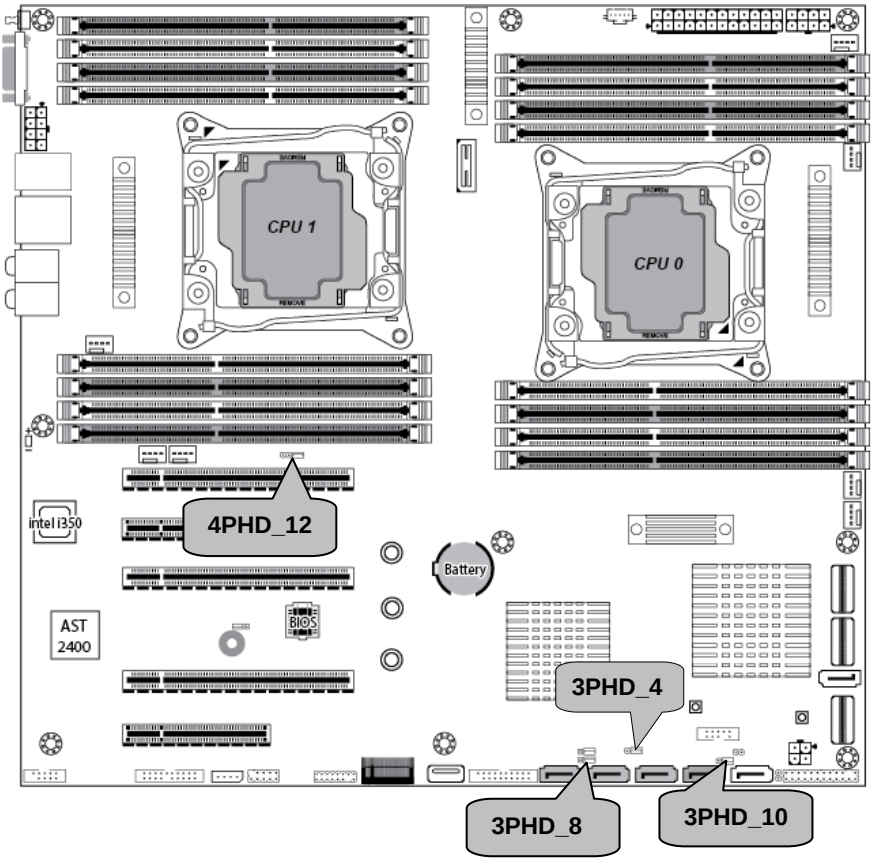
 1 - 2	**Pin 1-2 Closed**: Normal Mode (**Default**)
 2 - 3	**Pin 2-3 Closed**: Disable Gigabit and only has IPMI function

Pin	Signal	Pin	Signal
1	NC	2	PV_DIS_LAN_0
3	GND		

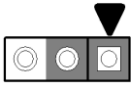
3PHD_2: Intel MIC Jumper

 1 - 2	**Pin 1-2 Closed**: Normal Mode (**Default**)
 2 - 3	**Pin 2-3 Closed**: Intel MIC Card

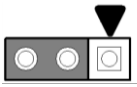
Pin	Signal	Pin	Signal
1	NC	2	MIC _EN
3	VCC3		


CPU 1
CPU 0
4PHD_12
intel i350
Battery
AST
2400
BIOS
3PHD_4
3PHD_8
3PHD_10

3PHD_4: ME Recovery Mode Jumper



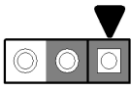
Pin	Signal	Pin	Signal
1	NC	2	FM_ME_RCVR_N
3	GND		



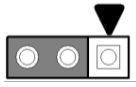
Pin 1-2 Closed: Normal Mode (**Default**)

Pin 2-3 Closed: ME Recovery Mode

3PHD_8: Flash Security Override Jumper



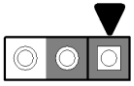
Pin	Signal	Pin	Signal
1	NC	2	MFG_MODE_N
3	GND		



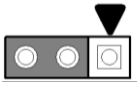
Pin 1-2 Closed: Normal Mode (**Default**)

Pin 2-3 Closed: Security Override

3PHD_10: PSU_Alert Enable Jumper



Pin	Signal	Pin	Signal
1	PSU_SMB_ALERT_ BMC_N	2	PSU_SMB_ALERT_ BMC_N_R
3	NC		

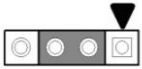


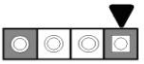
Pin 1-2 Closed: Enable (**Default**)

Pin 2-3 Closed: Disable PSU Alert

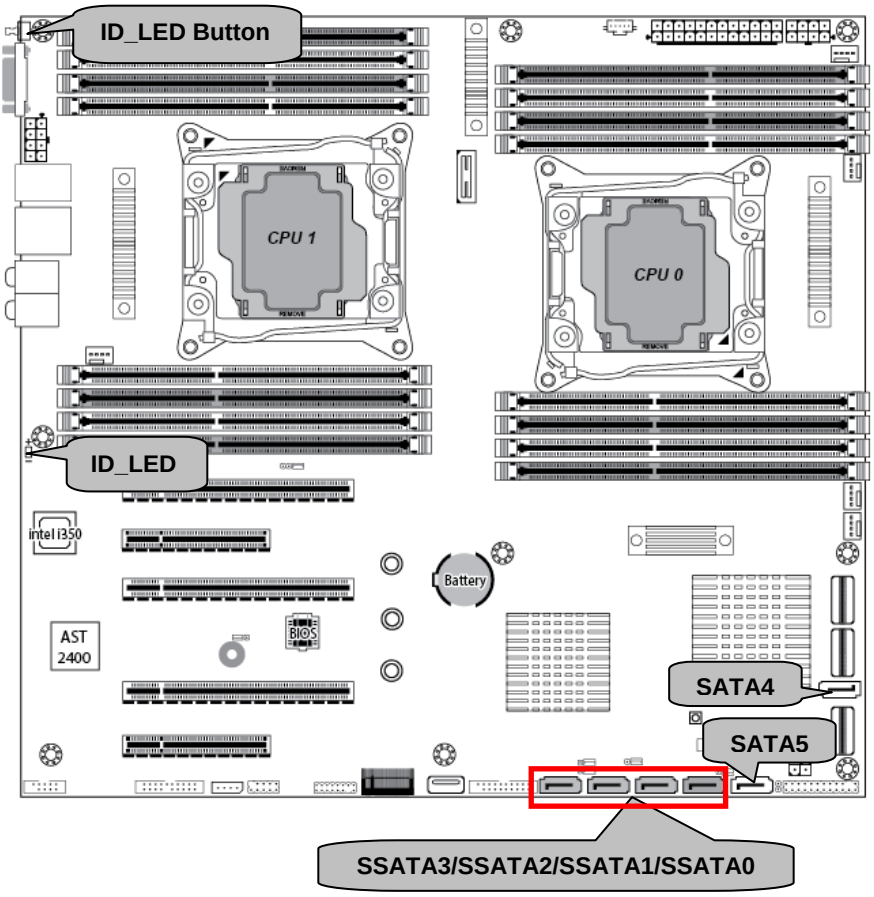
4PHD_12: BUZZER Disable Jumper

Pin	Signal	Pin	Signal
1	VCC5	2	NA
3	BUZ_1	4	BUZ_2

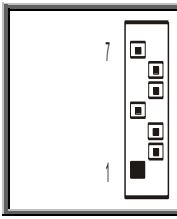




Pin 3-4 Closed: Normal Mode (**Default**)
Pin 2-3 Closed: Disable PC Beep
Pin 1-4 Closed: Use the External Speaker

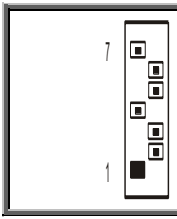

ID_LED Button
CPU 1
CPU 0
ID_LED
intel i350
Battery
AST
2400
BIOS
SATA4
SATA5
SSATA3/SSATA2/SSATA1/SSATA0

SATA4: SATA3.0 Connector(Blue)



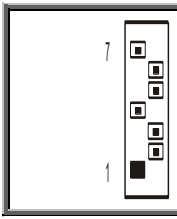
1	GND	Connects to the Serial ATA ready drives via the Serial ATA cable.
2	TXP	
3	TXN	
4	GND	
5	RXN	
6	RXP	
7	GND	

SATA5: SATA3.0 Connector(Blue)



1	GND	Connects to the Serial ATA ready drives via the Serial ATA cable.
2	TXP	
3	TXN	
4	GND	
5	RXN	
6	RXP	
7	GND	

SSATA0/1/2/3: Second SATA3.0 Connector(Black)



1	GND	Connects to the Serial ATA ready drives via the Serial ATA cable.
2	TXP	
3	TXN	
4	GND	
5	RXN	
6	RXP	
7	GND	

ID_LED / IDLED_BTN: ID LED and Button

Pin	Signal	
+	P3V3_AUX	
-	ID_SW_L	
State	**Color**	**Description**
On	Blue	System identified
Off	Off	System not identified
NOTE: The ID LED can be activated remotely using IPMI. Please visit the TYAN Web Site at **http://www.tyan.com** to download the latest IPMI Configuration Guide for more details.		

2.5 Installing the Processor and Heatsink

The types of processors supported by the S7070 are listed in the ***1.2 Hardware*** Specifications section on page 4. Check our website at **http://www.tyan.com** for the latest list of validated **Intel**® processors for this specific motherboard.

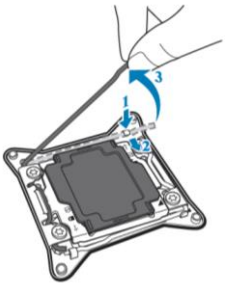
> **NOTE:** MiTAC is not liable for damage as a result of operating an unsupported configuration.

Processor Installation (Socket R3 for Intel Haswell CPU)

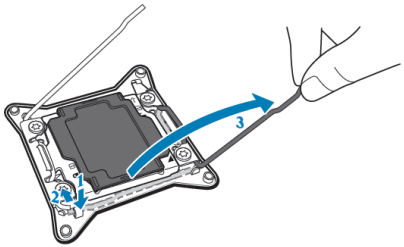
Follow the steps described later to install the processors and heat sinks.
The following pictures illustrate how to install the Intel® **Haswell-EP** processor on the Socket R3. Please note that the motherboard may not look exactly like the one you purchased. Therefore, the illustrations should be held for your reference only.

NOTE: Please save and replace the CPU protection cap when returning for service.

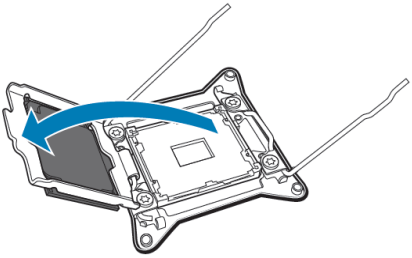
1. Locate the CPU socket.
2. Open the one side socket lever.



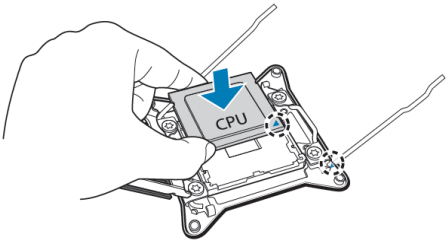
3. Open the other side of the lever.



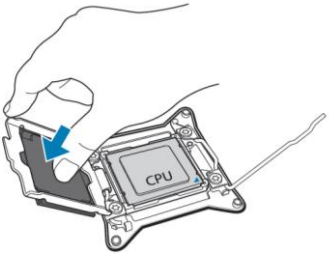
4. Lift the socket cover to a fully open position.



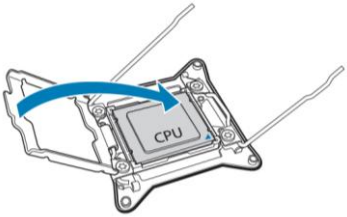
5. Place the CPU in the CPU socket and make sure that the gold arrow is located in the right direction with two notches properly aligned.



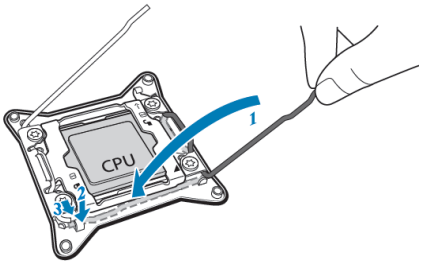
6. Remove the socket protection cap.



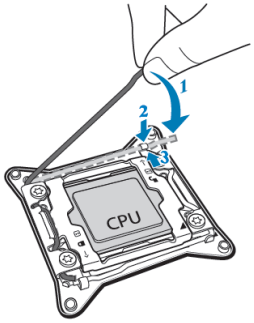
7. Close the CPU socket cover.



8. Close the socket one side lever.



9. Close the socket other side lever.



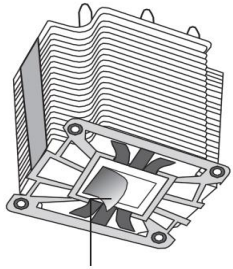
Heat sink Installation

After installing the processor, you will need to proceed to install the heat sink. The CPU heat sink will ensure that the processor do not overheat and continue to operate at maximum performance for as long as you own them. An overheated processor is dangerous to the motherboard. The processors will overheat within seconds, enter thermal protection, and shut down if heatsinks are not installed.
Caution：Take caution of the air flow must be in the direction which paralleled with memories.

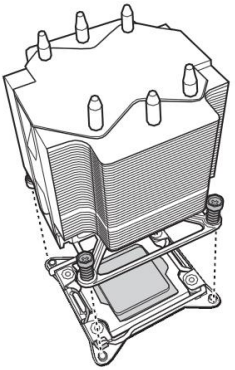
For the safest method of installation and information on choosing the appropriate heat sink, using heat sinks validated by Intel®. Please refer to the Intel® website: **http://www.intel.com**

The following diagram illustrates how to install the heatsink on the Intel® Haswell EP Socket R3:

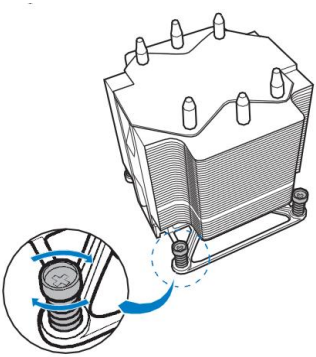
1. Tear down the heatsink protective cover.



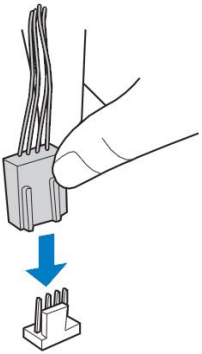
2. Place the heat sink on top of the CPU.



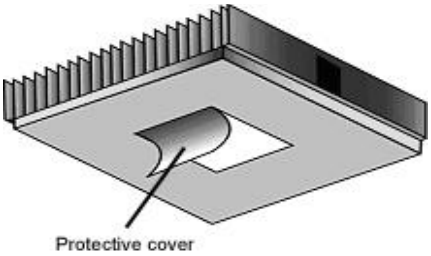
3. Secure the heatsink screws.

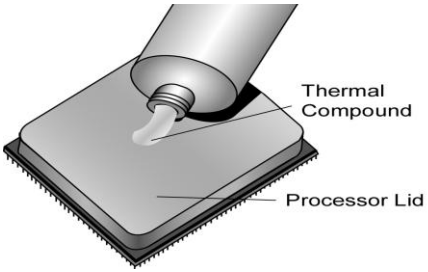


4. Connect the fan cable.



2.6 Thermal Interface Material





There are two types of thermal interface materials designed for use with the processors.

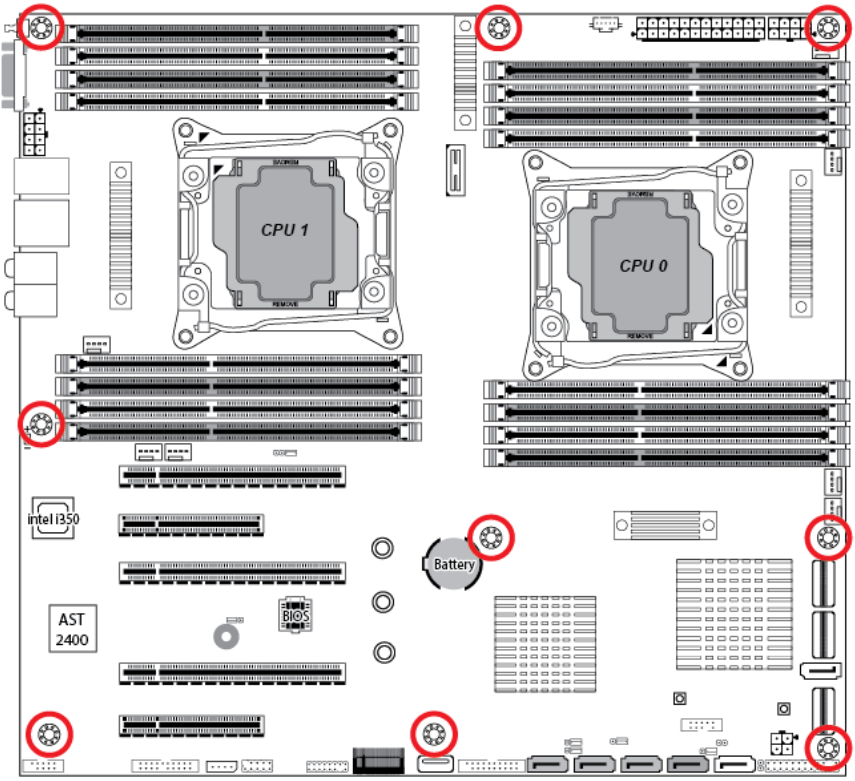
The most common material comes as a small pad attached to the heat sink at the time of purchase. There should be a protective cover over the material. Take care not to touch this material. Simply remove the protective cover and place the heat sink on the processor.

The second type of interface material is usually packaged separately. It is commonly referred to as 'thermal compound'. Simply apply a thin layer on to the CPU lid (applying too much will actually reduce the cooling).

NOTE: Always check with the manufacturer of the heat sink & processor to ensure that the thermal interface material is compatible with the processor and meets the manufacturer's warranty requirements.

2.7 Tips on Installing Motherboard in Chassis

Before installing your motherboard, make sure your chassis has the necessary motherboard support studs installed. These studs are usually metal and are gold in color. Usually, the chassis manufacturer will pre-install the support studs. If you are unsure of stud placement, simply lay the motherboard inside the chassis and align the screw holes of the motherboard to the studs inside the case. If there are any studs missing, you will know right away since the motherboard will not be able to be securely installed.

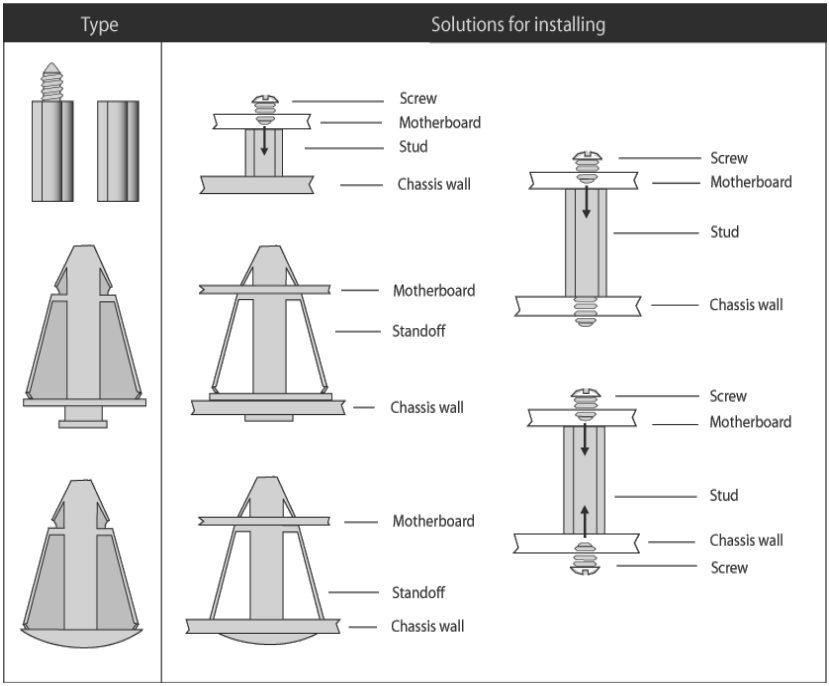


NOTE: Be especially careful to look for extra stand-offs. If there are any stand-offs present that are not aligned with a mounting hole on the motherboard, it will likely short components on the back of the motherboard when installed. This will cause malfunction and/or damage to your motherboard.

Some chassis include plastic studs instead of metal. Although the plastic studs are usable, MiTAC recommends using metal studs with screws that will fasten the motherboard more securely in place.

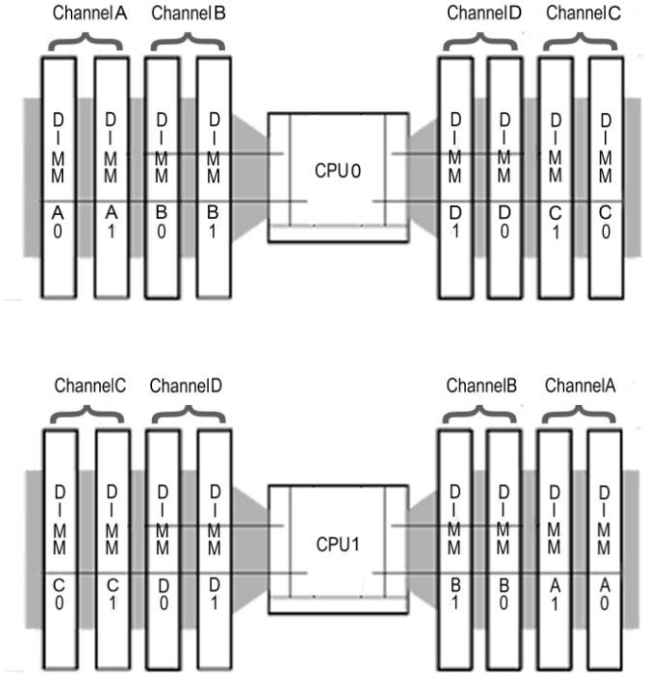
Below is a chart detailing what the most common motherboard studs look like and how they should be installed.

Mounting the Motherboard



2.8 Installing the Memory

Before installing memory, ensure that the memory you have is compatible with the motherboard and processor. Check the TYAN Web site at http://**www.tyan.com** for details of the type of memory recommended for your motherboard.



- The Intel® Xeon E5-2600 V3(22nm/Haswell processor is a dual-channel design with a total of 8 DDR4 channels
- This platform supports Registered DDR4 up to 256GB, LR DIMM (Load Reduced) DIMM DDR4 up to 512GB, and LRDIMM 3DS* DDR4 up to 1024GB
- DDR4 data transfer rates of 1600, 1866, and 2133 MT/s are supported
- 1.2V DDR4 DIMMs are supported
- All installed memory will automatically be detected. No jumpers or settings need to be changed for memory detection.
- All memory must be of the same type and density. **Registered and LRDIMM memory types can NOT be mixed and matched on the same motherboard.**

Recommended Memory Population Table (Single CPU)

	Single CPU Installed (CPU0 only)							
Quantity of memory installed	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
CPU0_DIMM_A0	√	√	√	√	√	√	√	√
CPU0_DIMM_A1					√	√	√	√
CPU0_DIMM_B0		√	√	√	√	√	√	√
CPU0_DIMM_B1						√	√	√
CPU0_DIMM_C0			√	√	√	√	√	√
CPU0_DIMM_C1							√	√
CPU0_DIMM_D0				√	√	√	√	√
CPU0_DIMM_D1								√

NOTE:

1. √ indicates a populated DIMM slot.
2. Install memory in sets of fours for maximum performance. This ensures that all four memory channels are properly utilized, providing maximum memory bandwidth.
3. Populate the same DIMM type in each channel, specifically
   - Use the same DIMM size
   - Use the same # of ranks per DIMM
4. Dual-rank DIMMs are recommended over single-rank DIMMs.

Recommended Memory Population Table (Dual CPU)

	Dual CPU installed (CPU0 and CPU1)										
Quantity of memory installed	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**10**	**12**	**14**	**16**
CPU0_DIMM_A0	√	√	√	√	√	√	√	√	√	√	√
CPU0_DIMM_A1								√	√	√	√
CPU0_DIMM_B0		√	√	√	√	√	√	√	√	√	√
CPU0_DIMM_B1									√	√	√
CPU0_DIMM_C0				√	√	√	√	√	√	√	√
CPU0_DIMM_C1									√	√	√
CPU0_DIMM_D0						√	√	√	√	√	√
CPU0_DIMM_D1											√
CPU1_DIMM_A0	√	√	√	√	√	√	√	√	√	√	√
CPU1_DIMM_A1								√	√	√	√
CPU1_DIMM_B0			√	√	√	√	√	√	√	√	√
CPU1_DIMM_B1										√	√
CPU1_DIMM_C0					√	√	√	√	√	√	√
CPU1_DIMM_C1										√	√
CPU1_DIMM_D0							√	√	√	√	√
CPU1_DIMM_D1											√

NOTE:

1. √ indicates a populated DIMM slot.
2. Install memory in sets of fours for maximum performance. This ensures that all four memory channels are properly utilized, providing maximum memory bandwidth.
3. Populate the same DIMM type in each channel, specifically
   - Use the same DIMM size
   - Use the same # of ranks per DIMM
4. Dual-rank DIMMs are recommended over single-rank DIMMs.

Intel® Xeon® processor E5-2600v3 product families Support

Type	Ranks Per DIMM and Data Width	DIMM Capacity (GB)		Speed (MT/s); Voltage (V); Slot Per Channel (SPC) and DIMM Per Channel (DPC)					
				1 Slot Per Channel	2 Slots Per Channel		3 Slots Per Channel		
				1DPC	1DPC	2DPC	1DPC	2DPC	3DPC
		4Gb	8Gb	1.2V	1.2V	1.2V	1.2V	1.2V	1.2V
RDIMM	SRx4	8GB	16GB	2133	2133	1866	2133	1866	1600
RDIMM	SRx8	4GB	8GB	2133	2133	1866	2133	1866	1600
RDIMM	DRx8	8GB	16GB	2133	2133	1866	2133	1866	1600
RDIMM	DRx4	16GB	32GB	2133	2133	1866	2133	1866	1600
LRDIMM	QRx4	32GB	64GB	2133	2133	2133	2133	2133	1600
LRDIMM 3DS†	8Rx4	64GB	128GB	2133	2133	2133	2133	2133	1600

NOTE 1: 1DPC => One dimm per channel

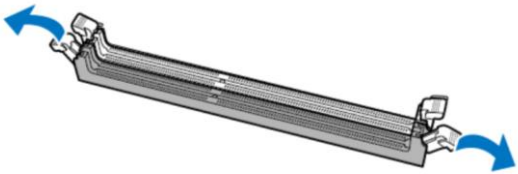
NOTE 2: 2DPC => Two dimm per channel

- Physical Ranks are used to calculate DIMM Capacity.
- Supported DRAM Densities are 4Gb, 8Gb.

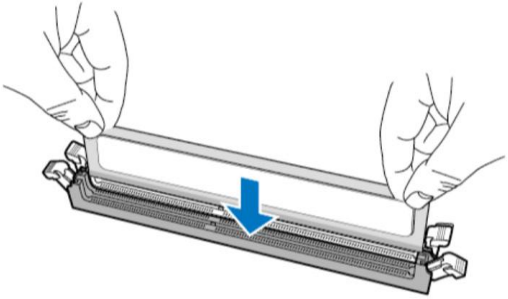
Memory Installation Procedure

Follow these instructions to install memory modules into the S7070.

1. Unlock a DIMM socket by Press the retaining clip outwardly in the following illustration.



2. Align the memory module with the socket，such that the DIMM NOTCH match the KEY SLOT on the socket.

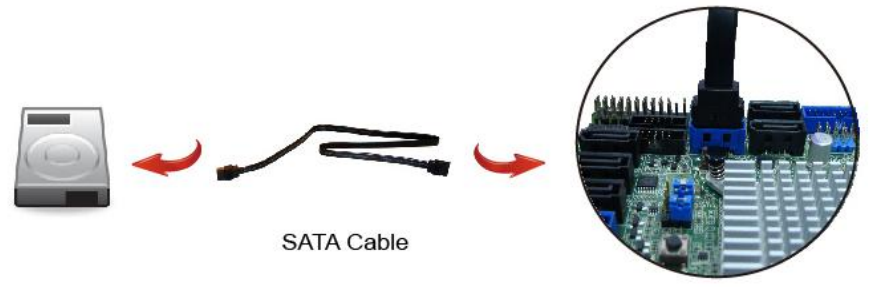


3. Seat the module firmly into the socket by gently pressing down until it sits flush with the socket. The locking levers pop up into place.

2.9 Attaching Drive Cables

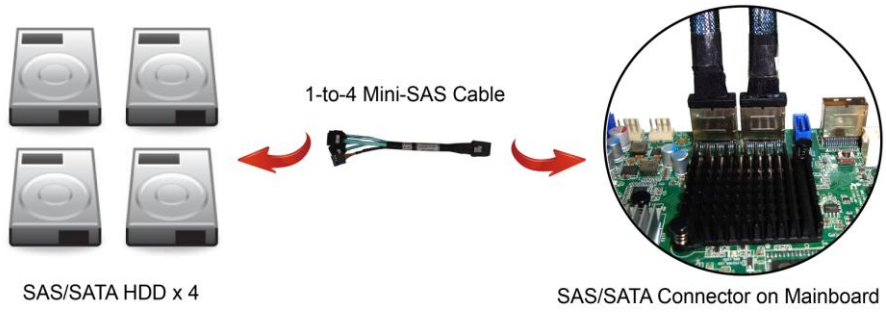
Attaching SATA Cables

The following illustrates how to make a SATA Cable connection. If you are in need of SATA/SAS cables or power adapters please contact your local sales representative.



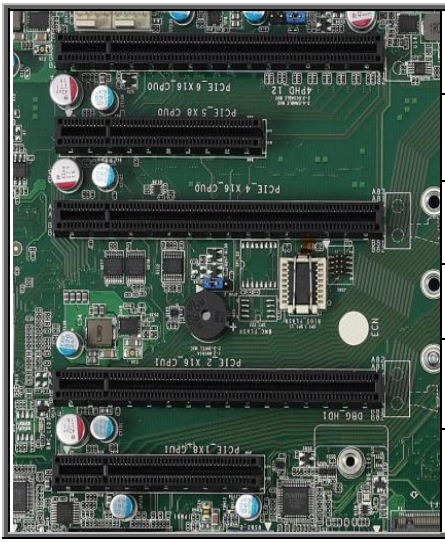
Attaching SAS Cables

The following illustrates how to make a SAS Cable connection. If you are in need of SATA/SAS cables or power adapters please contact your local sales representative.



2.10 Installing Add-In Cards

Before installing add-in cards, it's helpful to know if they are fully compatible with your motherboard. For this reason, we've provided the diagrams below, showing the slots that may appear on your motherboard.



1.Slot #6: PCI-E G3x16 slot (x8 or x16 link) (f/ CPU0)
2.Slot #5: PCI-E G3x8 slot (x8 or x0 link) (f/ CPU0) ODM/OEM
3.Slot #4: PCI-E G3 x16 slot (x16 link) (f/ CPU0)
4.Slot #2: PCI-E G3x16 slot (x16 link) (f/ CPU1)
5.Slot #1: PCI-E G3 x8 slot (x8 link) (f/ CPU1)open-end type

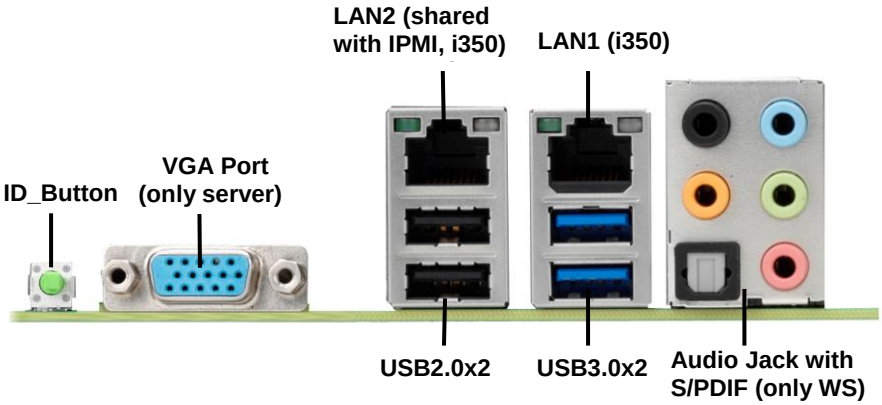
Simply find the appropriate slot for your add-in card and insert the card firmly. Do not force any add-in cards into any slots if they do not seat in place. It is better to try another slot or return the faulty card rather than damaging both the motherboard and the add-in card.

TIP: It's a good practice to install add-in cards in a staggered manner rather than making them directly adjacent to each other. Doing so allows air to circulate within the chassis more easily, thus improving cooling for all installed devices.

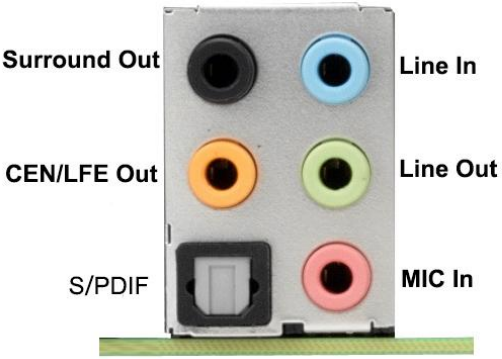
NOTE: You must always unplug the power connector from the motherboard before performing system hardware changes to avoid damaging the board or expansion device.

2.11 Connecting External Devices

Connecting external devices to the motherboard is an easy task. The motherboard supports a number of different interfaces through connecting peripherals. See the following diagrams for the details.



Audio Jack Definition



Onboard LAN LED Color Definition

The **two** onboard Ethernet ports have green and Amber LEDs to indicate LAN status. The chart below illustrates the different LED states.

1Gbps LAN Link/Activity LED Scheme			
Description		**Left LED (Link/Activity)**	**Right LED (Speed)**
No Link		OFF	OFF
10 Mbps	**Link**	Green	OFF
	Active	Blinking Green	OFF
100 Mbps	**Link**	Green	Solid Green
	Active	Blinking Green	Solid Green
1Gbps	**Link**	Green	Solid Amber
	Active	Blinking Green	Solid Amber

2.12 Installing the Power Supply

There are **Four (4)** power connectors on your S7070 motherboard. The S7070 supports EPS 12V power supply.

PWR1: ATX 24-Pin Power Connector

Signal	Pin	Pin	Signal
V3P3	1	13	V3P3
V3P3	2	14	-12V
GND	3	15	GND
+5V	4	16	PS_ON#
GND	5	17	GND
+5V	6	18	GND
GND	7	19	GND
PWROK	8	20	NC
5VSB	9	21	+5V
+12V	10	22	+5V
+12V	11	23	+5V
V3P3	12	24	GND

PWR2: SSI 8-Pin CPU/DIMM Power Connector

Signal	Pin	Pin	Signal
GND	1	5	P0_P12V
GND	2	6	P0_P12V
GND	3	7	P0_MEM_P12V
GND	4	8	P0_MEM_P12V

PWR3: SSI 8-Pin CPU/DIMM Power Connector

Signal	Pin	Pin	Signal
GND	1	5	P1_P12V
GND	2	6	P1_P12V
GND	3	7	P1_MEM_P12V
GND	4	8	P1_MEM_P12V

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

NOTE: The PW4 is reserved for PCIE slot 12V supplement if the PCIE card and the MB FAN's 12V power consumption exceed the maximum 12V out of PSU's PW1.

NOTE: You must unplug the power supply before plugging the power cables to motherboard connectors.

2.13 Finishing Up

Congratulations on making it this far! You have finished setting up the hardware aspect of your computer. Before closing up your chassis, make sure that all cables and wires are connected properly, especially SATA cables and most importantly, jumpers. You may have difficulty powering on your system if the motherboard jumpers are not set correctly.
In the rare circumstance that you have experienced difficulty, you can find help by asking your vendor for assistance. If they are not available for assistance, please find setup information and documentation online at our website or by calling your vendor's support line.

Chapter 3: BIOS Setup

3.1 About the BIOS

The BIOS is the basic input/output system, the firmware on the motherboard that enables your hardware to interface with your software. The BIOS determines what a computer can do without accessing programs from a disk. The BIOS contains all the code required to control the keyboard, display screen, disk drives, serial communications, and a number of miscellaneous functions. This chapter describes the various BIOS settings that can be used to configure your system.

The BIOS section of this manual is subject to change without notice and is provided for reference purposes only. The settings and configurations of the BIOS are current at the time of print and are subject to change, and therefore may not match exactly what is displayed on screen.

This section describes the BIOS setup program. The setup program lets you modify basic configuration settings. The settings are then stored in a dedicated, battery-backed memory (called NVRAM) that retains the information even when the power is turned off.

To start the BIOS setup utility:

1. Turn on or reboot your system.
2. Press <**F2**> or <**Del>** during POST (<**Tab**> on remote console) to start the BIOS setup utility.

3.1.1 Setup Basics

The table below shows how to navigate in the setup program using the keyboard.

Key	Function
<F1>	General help window
<ESC>	Exit current menu
←arrow → keys	Select a different menu
↑ or ↓ arrow keys	Move cursor up/down
<Tab> / <Shift-Tab>	Cycle cursor up/down
<Home> / <End>	Move cursor to top/bottom of the window
<PgUp> / <PgDn>	Move cursor to next/previous page
<->	Select the previous value/setting of the field
<+>	Select the next value/setting of the field
<F8>	Load Fail Safe default configuration values of the menu
<F3>	Load the Optimal default configuration values of the menu
<F4>	Save and exit
<Enter>	Execute command or select submenu

3.1.2 Getting Help

Pressing [**F1**] will display a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press [**ESC**] or the [**Enter**] key again.

3.1.3 In Case of Problems

If you have trouble booting your computer after making and saving the changes with the BIOS setup program, you can restart the computer by holding the power button down until the computer shuts off (usually within 4 seconds); resetting by pressing CTRL-ALT-DEL; or clearing the CMOS.
The best advice is to only alter settings that you thoroughly understand. In particular, do not change settings in the Chipset section unless you are absolutely sure of what you are doing. The Chipset defaults have been carefully chosen either by MiTAC or your system manufacturer for best performance and reliability. Even a seemingly small change to the Chipset setup options may cause the system to become unstable or unusable.

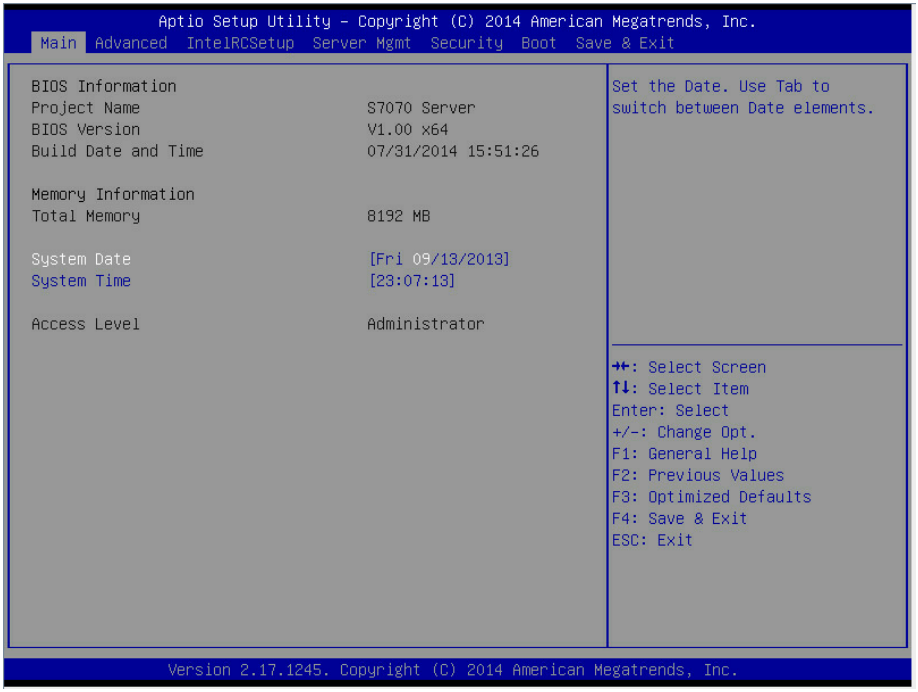
3.1.4 Setup Variations

Not all systems have the same BIOS setup layout or options. While the basic look and function of the BIOS setup remains more or less the same for most systems, the appearance of your Setup screen may differ from the charts shown in this section. Each system design and chipset combination requires a custom configuration. In addition, the final appearance of the Setup program depends on the system designer. Your system designer may decide that certain items should not be available for user configuration, and remove them from the BIOS setup program.

NOTE: The following pages provide the details of BIOS menu. Please be aware that the BIOS menus are continually changing due to continual BIOS updates over the product lifespan of the motherboard. The BIOS menus provided are current as of the date when this manual was written. Please visit TYAN's website at http://www.tyan.com for information on BIOS updates available for this specific motherboard.

3.2 Main Menu

In this section, you can alter general features such as the date and time.
Note that the options listed below are for options that can directly be changed within the Main Setup screen.



BIOS Information
It displays BIOS related information.

Memory Information
This displays the total memory size.

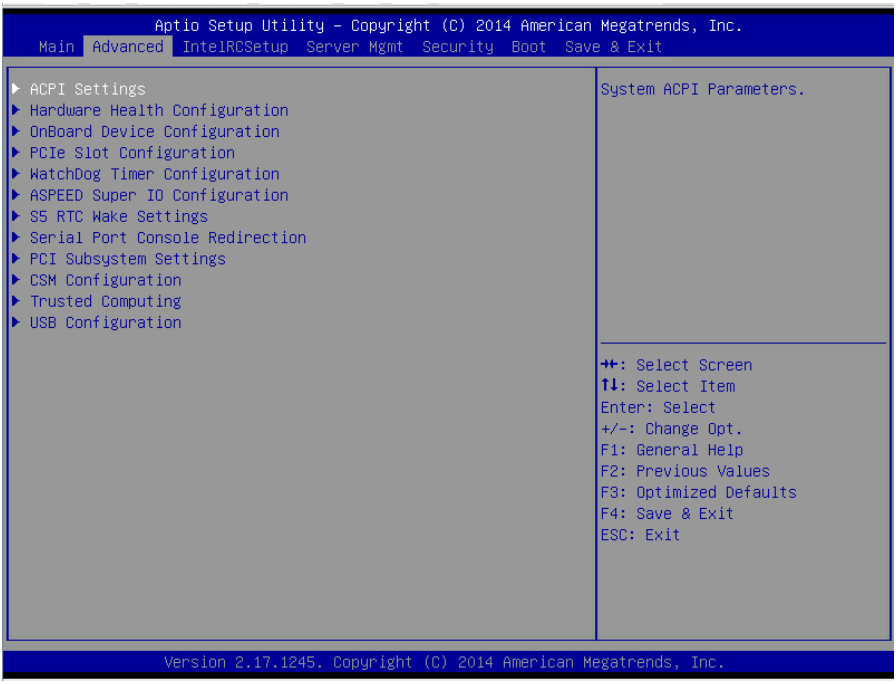
System Date
Adjust the system date.
MM (Months): DD (Days): YYYY (Years)

System Time
Adjust the system clock.
HH (24 hours format): MM (Minutes): SS (Seconds)

Access Level
Read only.

3.3 Advanced Menu

This section facilitates configuring advanced BIOS options for your system.



ACPI Settings
System ACPI Parameters.

Hardware Health Configuration
Hardware health Configuration Parameters.

Onboard Device Configuration
Onboard Device Configuration.

PCIe Slot Configuration
Onboard PCIe Slot Configuration

WatchDog Timer Configuration
WatchDog Configuration

ASPEED Super IO Configuration
System Super IO Chip parameters

S5 RTC Wake Settings
S5 RTC Wake Settings

Serial Port Console Redirection
Serial Port Console Redirection

PCI Subsystem Settings
PCI, PCI-X and PCI Express Settings

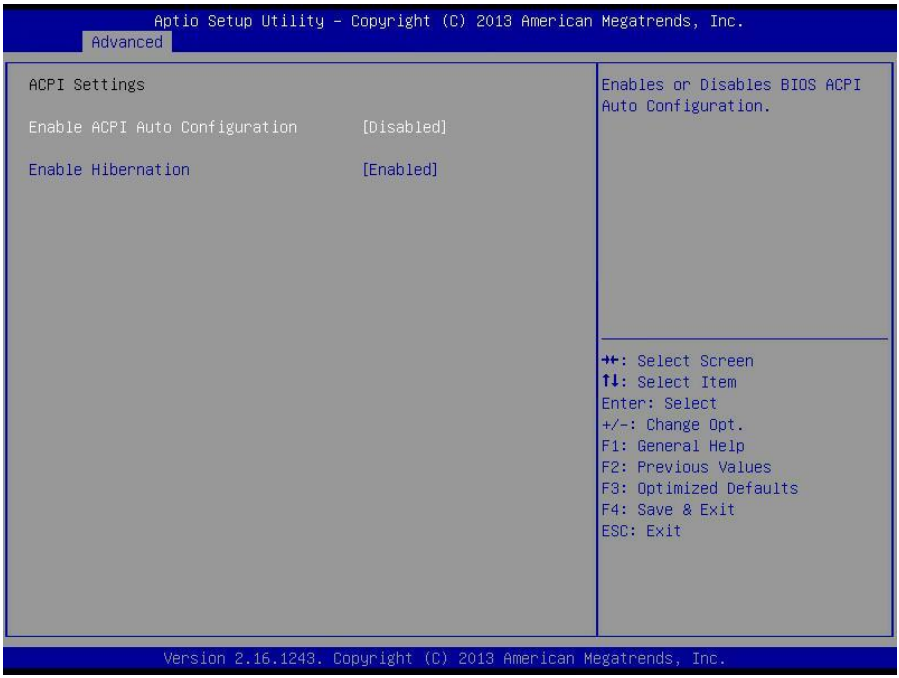
CSM Configuration
CSM Configuration, Enable/Disable Option ROM execution setting,etc

Trusted Computing (optional function)
Trusted Computing (TPM) settings.

NOTE: If no TPM chipset is on, the Trusted Computing submenu will not appear.

USB Configuration
USB Configuration Parameters.

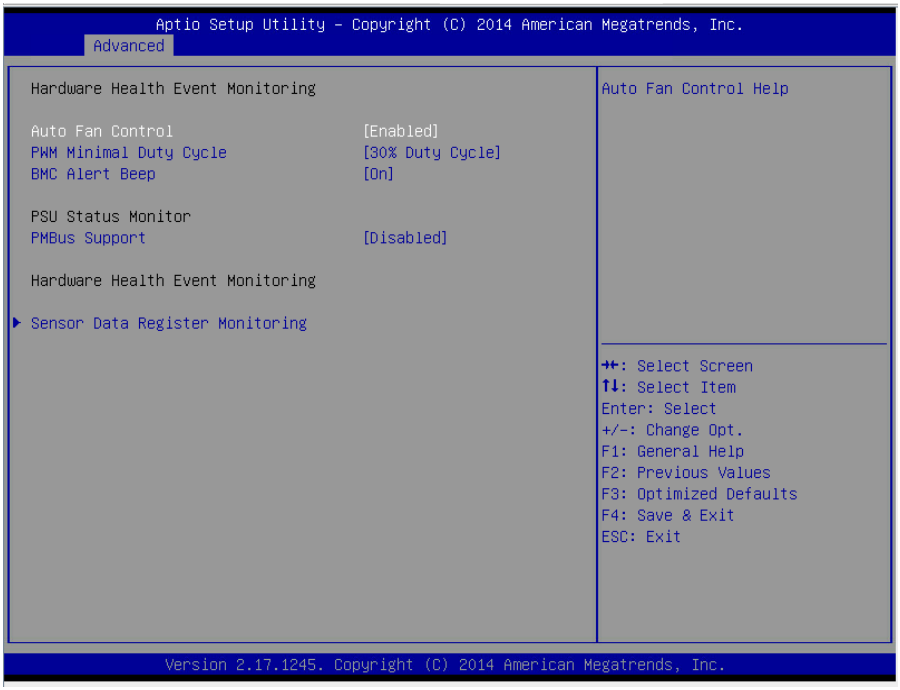
3.3.1 ACPI Settings



Enable ACPI Auto Configuration
Enable or disable BIOS ACPI Auto Configuration.
Disabled / Enabled

Enable Hibernation
Enables or disables System ability to Hibernate (OS/S4 Sleep State). This option may not be effective with some OS.
Disabled / **Enabled**

3.3.2 Hardware Health Configuration



Auto Fan Control
Auto Fan Control help.
Disabled **/ Enabled**

NOTE: Auto Fan Control must be set to [Enable] PWM Minimal Duty Cycle menu will appear.

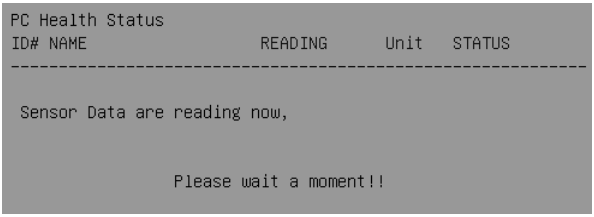
PWM Minimal Duty Cycle
Duty Cycle control range
30% Duty Cycle / 45% Duty Cycle / 60% Duty Cycle

BMC Alert Beep
BMC Alert Beep On/Off.
On / Off

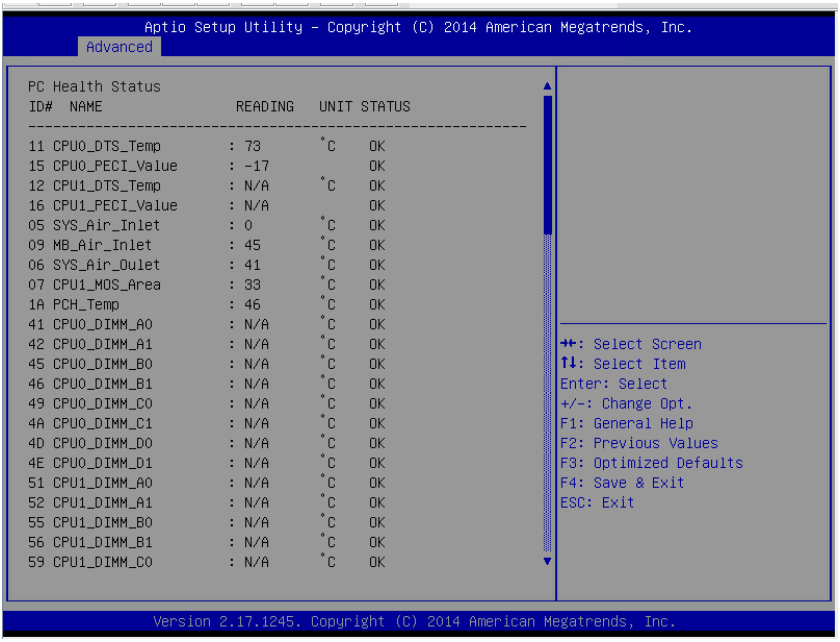
PSU Status Monitor
PMBus support
Disabled / Enabled

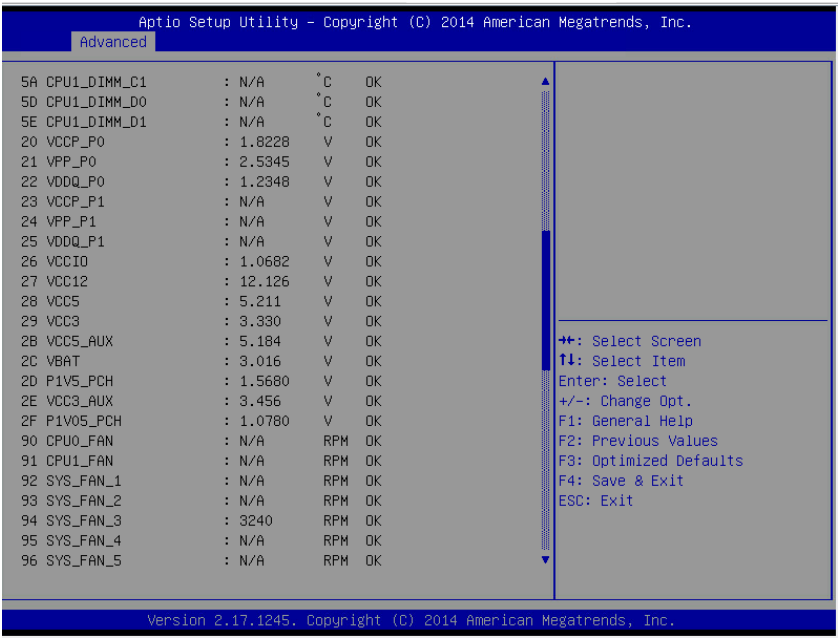
3.3.2.1 Sensor Data Register Monitoring

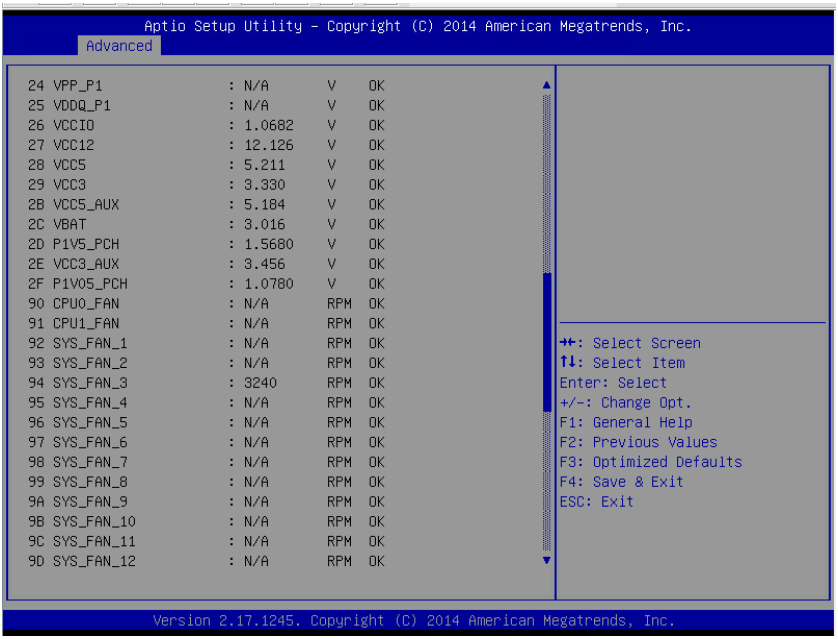
When you enter the **Sensor Data Register Monitoring** submenu, you will see the following dialog window pop out. Please wait 8~10 seconds.



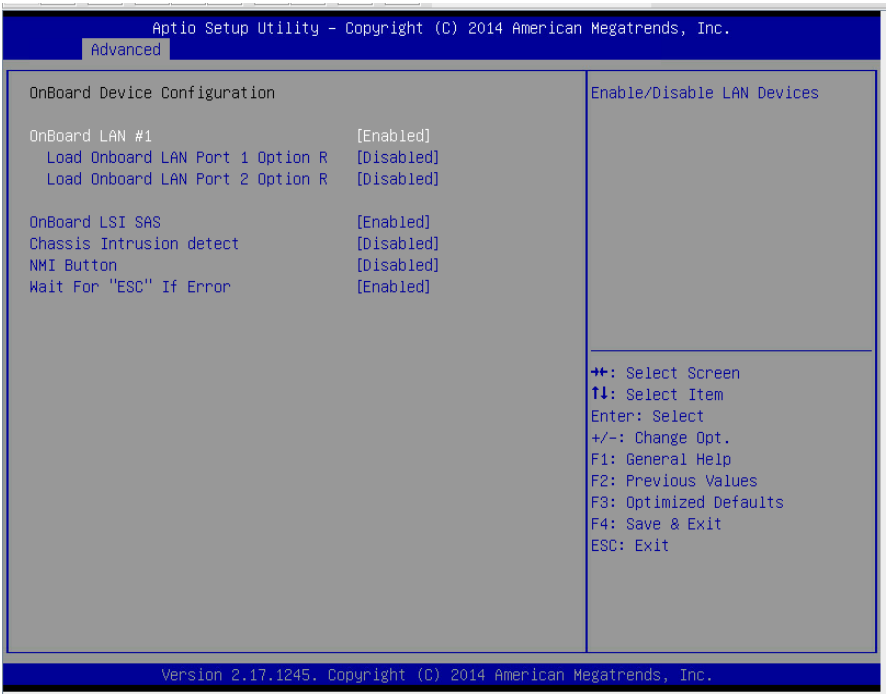
NOTE 1: SDR can not be modified. Read only.


Aptio Setup Utility – Copyright (C) 2014 American Megatrends, Inc.
Advanced
PC Health Status
ID# NAME READING UNIT STATUS
11 CPU0_DTS_Temp : 73 °C OK
15 CPU0_PECI_Value : -17 OK
12 CPU1_DTS_Temp : N/A °C OK
16 CPU1_PECI_Value : N/A OK
05 SYS_Air_Inlet : 0 °C OK
09 MB_Air_Inlet : 45 °C OK
06 SYS_Air_Oulet : 41 °C OK
07 CPU1_MOS_Area : 33 °C OK
1A PCH_Temp : 46 °C OK
41 CPU0_DIMM_A0 : N/A °C OK
42 CPU0_DIMM_A1 : N/A °C OK
45 CPU0_DIMM_B0 : N/A °C OK
46 CPU0_DIMM_B1 : N/A °C OK
49 CPU0_DIMM_C0 : N/A °C OK
4A CPU0_DIMM_C1 : N/A °C OK
4D CPU0_DIMM_D0 : N/A °C OK
4E CPU0_DIMM_D1 : N/A °C OK
51 CPU1_DIMM_A0 : N/A °C OK
52 CPU1_DIMM_A1 : N/A °C OK
55 CPU1_DIMM_B0 : N/A °C OK
56 CPU1_DIMM_B1 : N/A °C OK
59 CPU1_DIMM_C0 : N/A °C OK
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.17.1245. Copyright (C) 2014 American Megatrends, Inc.


Aptio Setup Utility – Copyright (C) 2014 American Megatrends, Inc.
Advanced
5A CPU1_DIMM_C1 : N/A °C OK
5D CPU1_DIMM_D0 : N/A °C OK
5E CPU1_DIMM_D1 : N/A °C OK
20 VCCP_P0 : 1.8228 V OK
21 VPP_P0 : 2.5345 V OK
22 VDDQ_P0 : 1.2348 V OK
23 VCCP_P1 : N/A V OK
24 VPP_P1 : N/A V OK
25 VDDQ_P1 : N/A V OK
26 VCCIO : 1.0682 V OK
27 VCC12 : 12.126 V OK
28 VCC5 : 5.211 V OK
29 VCC3 : 3.330 V OK
2B VCC5_AUX : 5.184 V OK
2C VBAT : 3.016 V OK
2D P1V5_PCH : 1.5680 V OK
2E VCC3_AUX : 3.456 V OK
2F P1V05_PCH : 1.0780 V OK
90 CPU0_FAN : N/A RPM OK
91 CPU1_FAN : N/A RPM OK
92 SYS_FAN_1 : N/A RPM OK
93 SYS_FAN_2 : N/A RPM OK
94 SYS_FAN_3 : 3240 RPM OK
95 SYS_FAN_4 : N/A RPM OK
96 SYS_FAN_5 : N/A RPM OK
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.17.1245. Copyright (C) 2014 American Megatrends, Inc.


Aptio Setup Utility – Copyright (C) 2014 American Megatrends, Inc.
Advanced
24 VPP_P1 : N/A V OK
25 VDDQ_P1 : N/A V OK
26 VCCIO : 1.0682 V OK
27 VCC12 : 12.126 V OK
28 VCC5 : 5.211 V OK
29 VCC3 : 3.330 V OK
2B VCC5_AUX : 5.184 V OK
2C VBAT : 3.016 V OK
2D P1V5_PCH : 1.5680 V OK
2E VCC3_AUX : 3.456 V OK
2F P1V05_PCH : 1.0780 V OK
90 CPU0_FAN : N/A RPM OK
91 CPU1_FAN : N/A RPM OK
92 SYS_FAN_1 : N/A RPM OK
93 SYS_FAN_2 : N/A RPM OK
94 SYS_FAN_3 : 3240 RPM OK
95 SYS_FAN_4 : N/A RPM OK
96 SYS_FAN_5 : N/A RPM OK
97 SYS_FAN_6 : N/A RPM OK
98 SYS_FAN_7 : N/A RPM OK
99 SYS_FAN_8 : N/A RPM OK
9A SYS_FAN_9 : N/A RPM OK
9B SYS_FAN_10 : N/A RPM OK
9C SYS_FAN_11 : N/A RPM OK
9D SYS_FAN_12 : N/A RPM OK
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.17.1245. Copyright (C) 2014 American Megatrends, Inc.

3.3.3 Onboard Device Configuration



Onboard LAN #1
Enable or disable the Onboard Network Controller.
Enabled / Disabled

Load Onboard LAN1/2 Option ROM
Enabled/Disabled the LAN Option ROM in the Chipset.
Enabled with iSCSI **/** Enabled with PXE / **Disabled**

NOTE: The ISCSI function is only supported in LAN1.

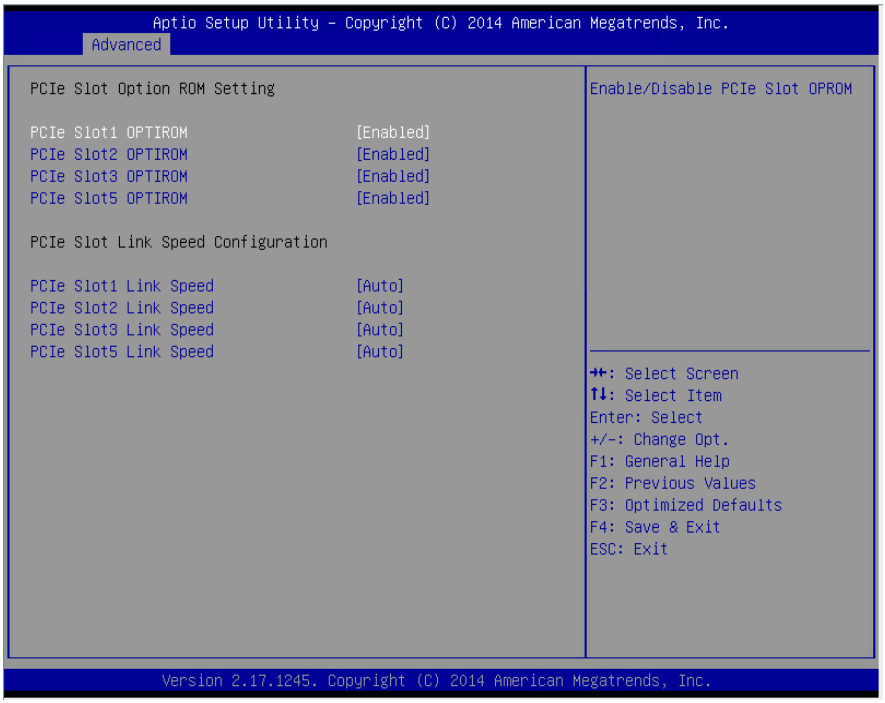
Onboard LSI SAS
Enable or disable Onboard LSI SAS Controller
Enabled / Disabled

Chassis Intrusion detect
Enabled: When a chassis open event is detected ,the BIOS will record the event.
Disabled / PXE

NMI Button
Enable or disable NMI button.
Enabled / **Disabled**

Wait For 'ESC' if Error
Enable or disable wait ESC key function. When chassis intrusion. CMOS Clear or BMC not Response.
Enabled / Disabled

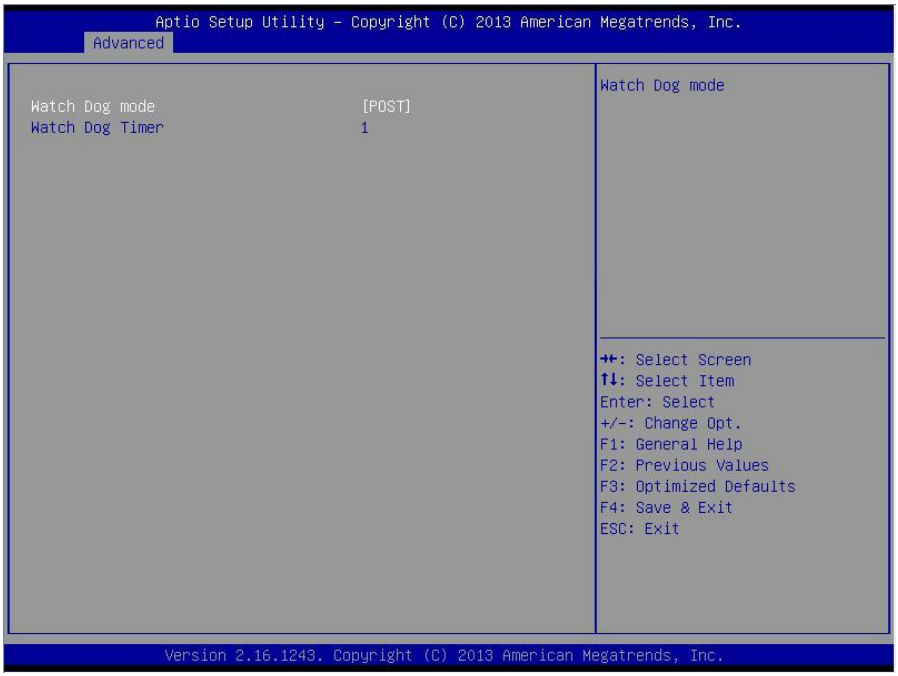
3.3.4 PCIe Slot Configuration



PCIe SLOT1/2/3/5 OPTROM
Enabled/Disabled Load OPTROM for PCIe slot devices.
Enabled / Disabled

PCIe SLOT1/2/3/5 LINK SPEED
Onboard PCIe Link Slot Link, Speed Configuration
Auto / GEN1(2.5GT/s) / GEN2(5GT/s) / GEN3(8GT/s)

3.3.5 Watchdog Timer Configuration

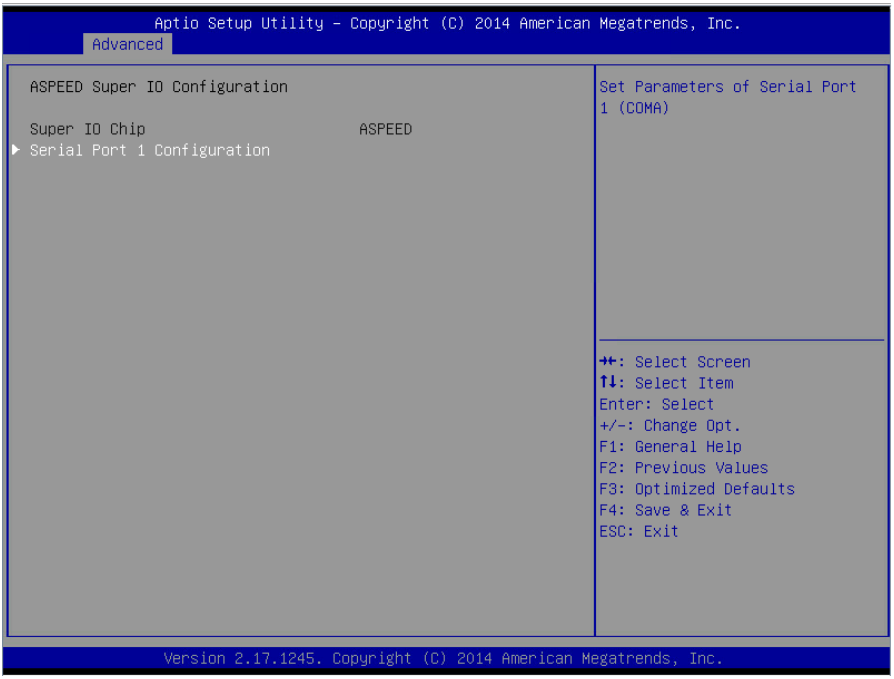


Watch Dog Mode
Watch Dog Mode Help.
Disabled / POST / OS / PowerON

NOTE: Watch Dog Timer will appear when **Watch Dog Mode** is not set to [Disabled].

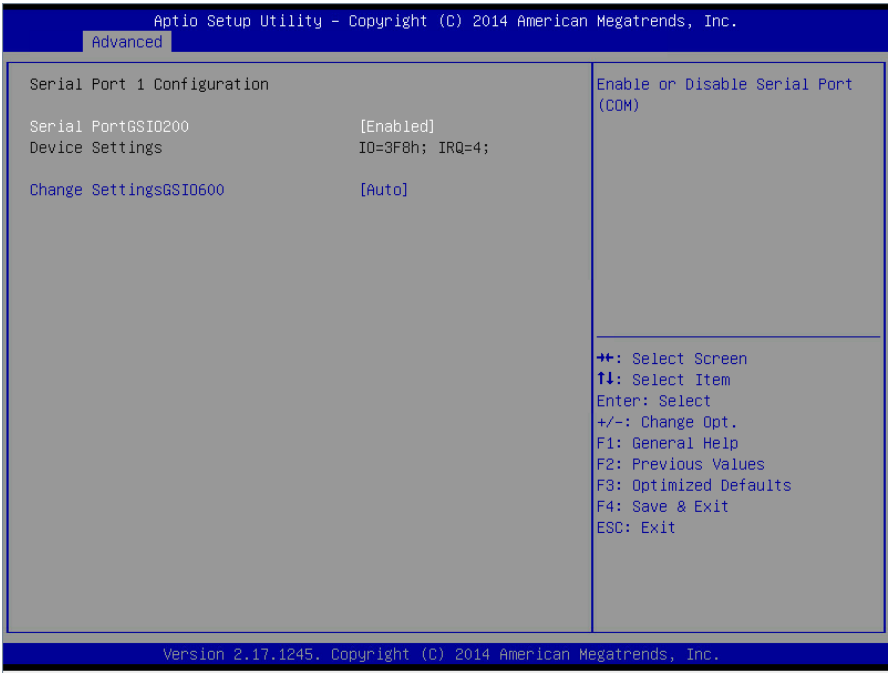
Watch Dog Timer
Watch Dog Timer Help.

3.3.6 ASPEED Super IO Configuration



Super IO Chip
Read only.

3.3.6.1 Serial Port 1 Configuration



Serial PortGSIO200
Enable or disable Serial Port (COM).

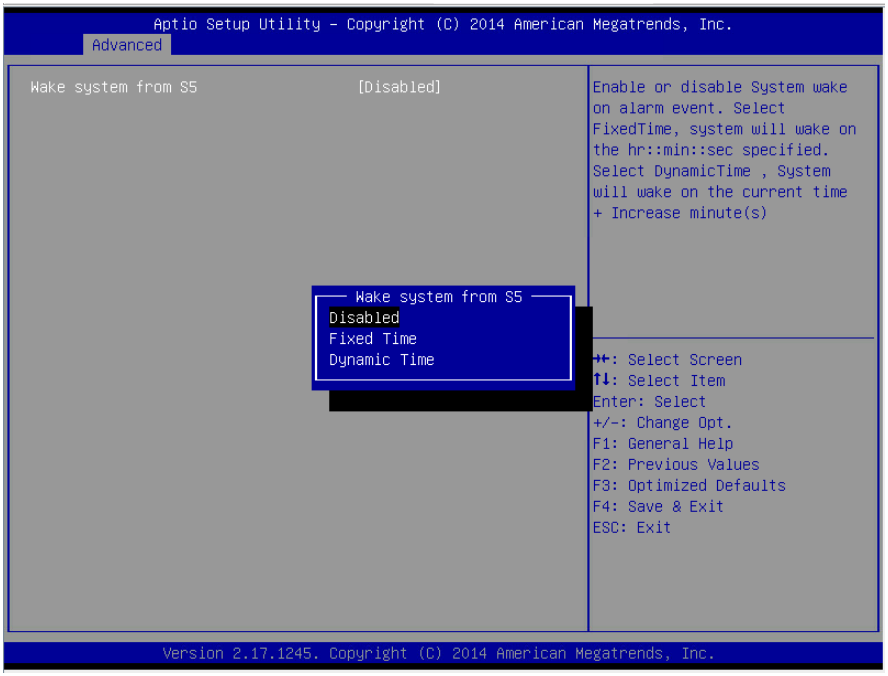
Enabled / Disabled

Device Settings
Read only.

Change SettingsGSIO600
Select an optimal setting for Super IO Device.

Auto / IO=3F8h; IRQ=4;
/ IO=3F8h, IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;
/ IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;
/ IO=3E8h, IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;
/ IO=2E8h, IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

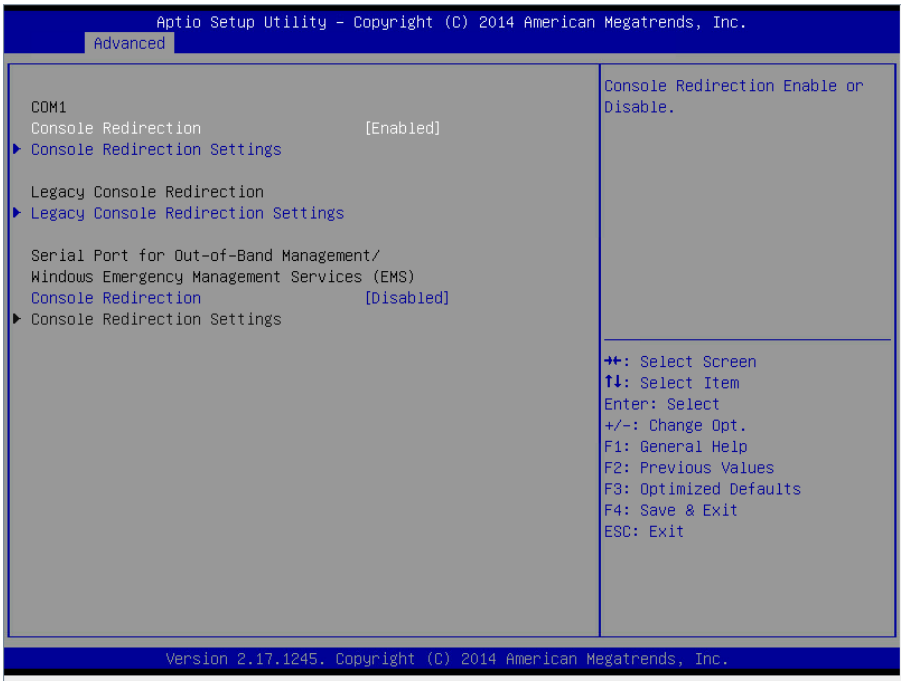
3.3.7 S5 RTC Wake Settings



Wake system from S5
Enable or disable system wake on alarm event. Select Fixed time, system will wake on the hr::min::sec specified. Select dynamic time, system will wake on the current time+ increase minute(s)

Disabled / Fixed time /Dynamic time

3.3.8 Serial Port Console Redirection

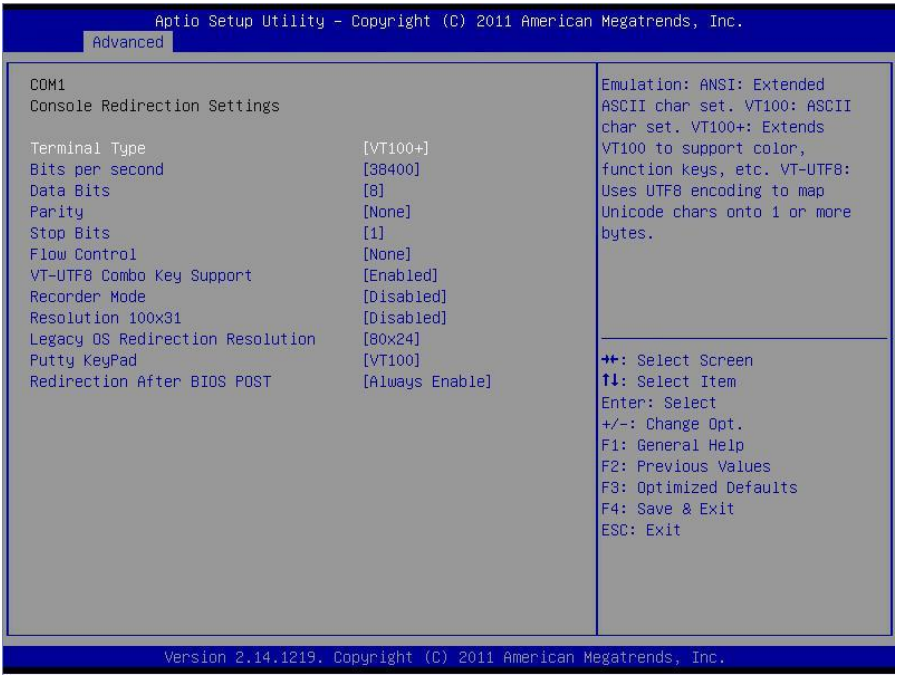


Console Redirection
Console redirection enable or disable.
Disabled **/ Enabled**

Serial Port for Out-Of-Band Management/Windows Emergency Services (EMS) Console Redirection
Console redirection enable or disable.
Disabled **/ Enabled**

Console Redirection Settings
The settings specify how the host computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.
NOTE: Console Redirection Settings menu only appear when **Console Redirection** was set to **[Enabled].**

3.3.8.1 Console Redirection Settings



Terminal Type
Emulation: ANSI: Extended ASCII charset.
VT100: ASCII charset.
VT100+: Extends VT100 to support color function keys, etc.
VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.
VT-UTF8 **/** VT100 / **VT100+** / ANSI

Bits per Second
Select serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.
38400 / 9600 / 19200 / 115200 / 57600

Data Bits
8 / 7

Parity
A parity bit can be sent with the data bits to detect some transmission errors. Even: parity bit is 0 if the num of 1's in the data bits is even. Odd: parity bit is 0 if the num of 1's in the data bits is odd. Mark: parity bit is always 1. Space: parity bit is always 0. Mark and Space parity do not allow for error detection.
None / Even / Odd / Mark / Space

Stop Bits
Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.

1 / 2

Flow Control
Flow Control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to restart the flow. Hardware flow control uses two wires to send start/stop signal.

None / Hardware RTS/CTS

VT-UTF8 Combo Key Support
Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals.

Enabled / Disabled

Recorder Mode
With this mode enabled only text will be sent. This is to capture Terminal data.

Disabled / Enabled

Resolution 100x31
Enable or disable extended terminal resolution.

Disabled / Enabled

Legacy OS Redirection Resolution
On Legacy OS, the number of rows and columns supported redirection.

80x24 / 80x25

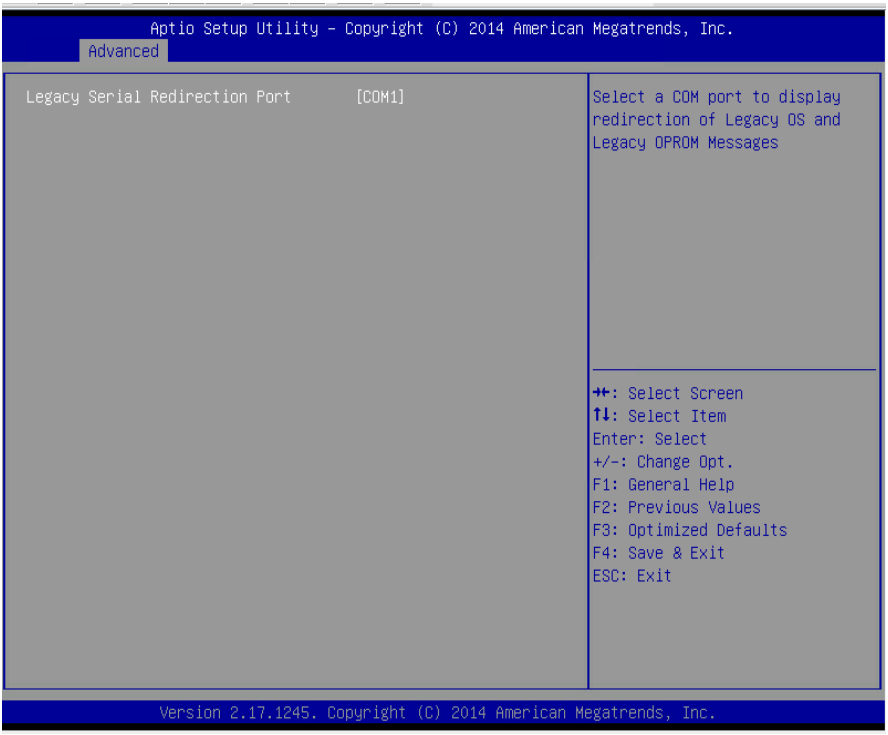
Putty KeyPad
Select FunctionKey and KeyPad on Putty.

VT100 / LINUX / XTERMR6 / SCO / ESCN / VT400

Redirection After BIOS POST
The settings specify if bootloader is selected than Legacy console redirection is disabled before booting to Legacy OS. Default value is always enable means Legacy.

Always enable / Bootloader

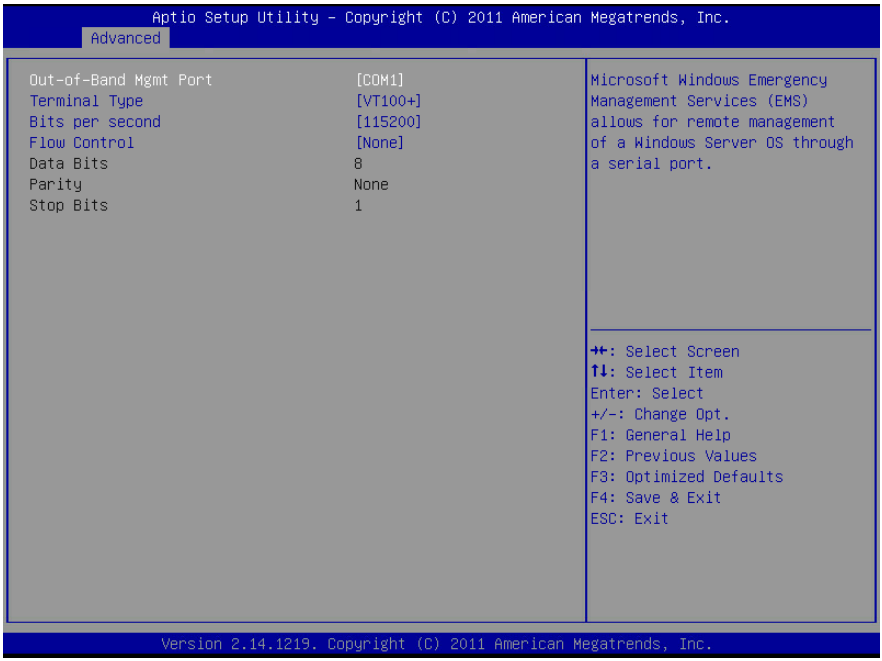
3.3.8.2 Console Redirection Settings



Legacy Serial Redirection Port
Select a COM port to display redirection of Legacy OS and Legacy OPROM Messages

COM1

3.3.8.3 Serial Port for Out-Of-Band Management/Windows Emergency Services (EMS) Console Redirection Settings



Out-of Band Mgmt Port
Microsoft Windows Emergency Management Services (EMS) allows for remote management of a Windows Server OS through a serial port.

COM1 / COM2

Terminal Type
VT-UTF8 is the preferred terminal type for out-of-band management. The next best choice is VT100+ and then VT100. See above, in Console Redirection Settings page, for more Help with Terminal Type/Emulation.

VT-UTF8 **/** VT100 / **VT100+** / ANSI

Bits per Second
Select serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.

115200 / 9600 / 19200 / 38400 / 57600

Flow Control
Flow Control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a ‘stop’ signal can be sent to stop the data flow. Once the

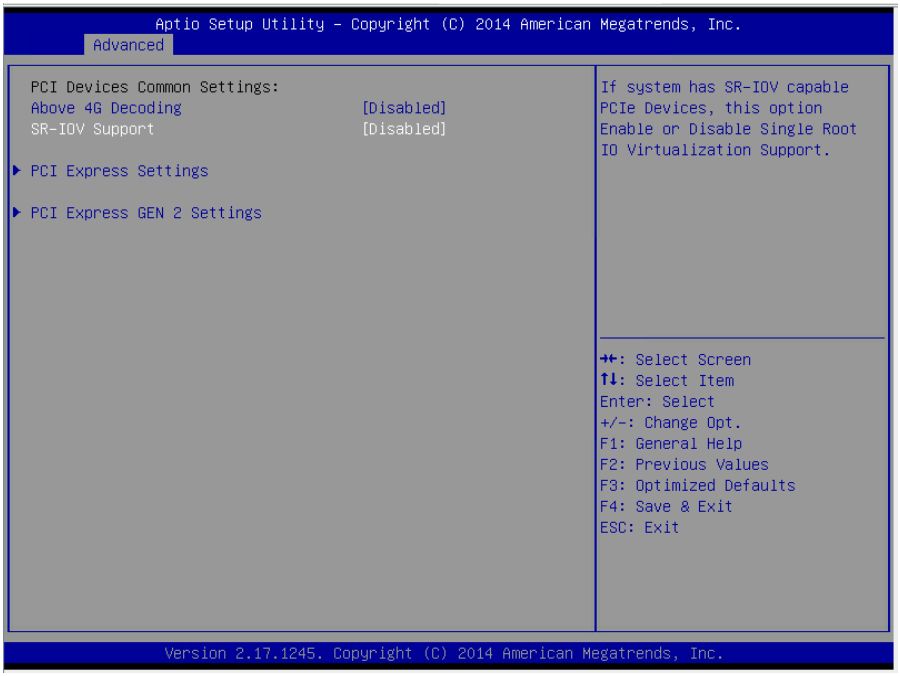
buffers are empty, a ‘start’ signal can be sent to restart the flow. Hardware flow control uses two wires to send start/stop signal.

None / Hardware RTS/CTS

Data Bits / Parity / Stop Bits

Read only.

3.3.9 PCI Subsystem



Above 4G Decoding

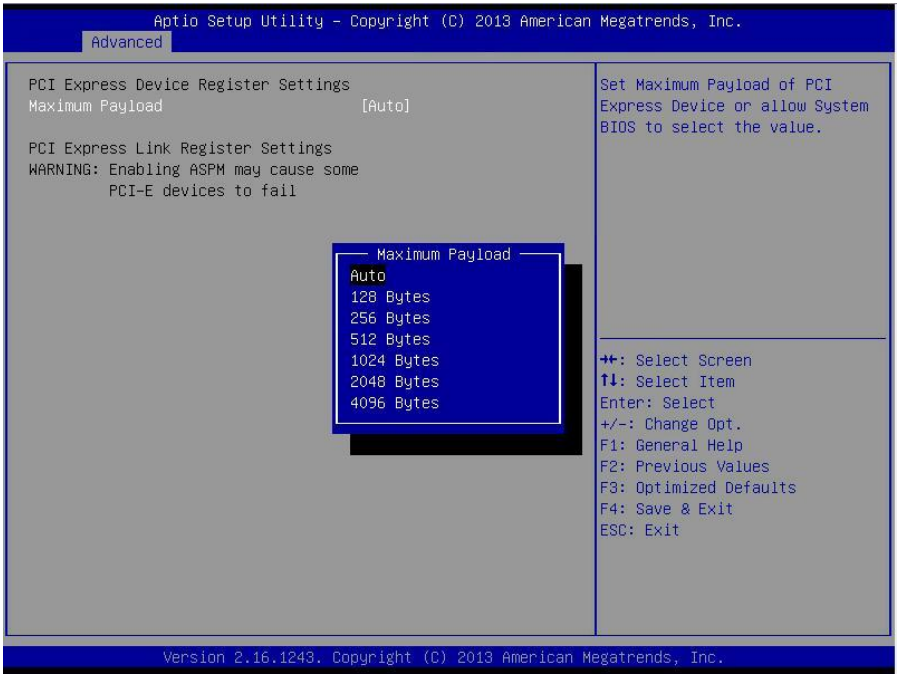
Enables or Disables 64bit capable Devices to be decoded in Above 4G Address Space(Only if System supports 64 bit PCI decoding).

Enable **/ Disabled**

SR-IOV Supporting

Enable **/ Disabled**

3.3.9.1 PCI Express settings



Maximum Payload
Set maximum payload of PCI express device or allow system BIOS to select the value.

Auto / 128 Bytes / 256 Bytes / 512 Bytes / 1024 Bytes /2048 Bytes / 4056 Bytes

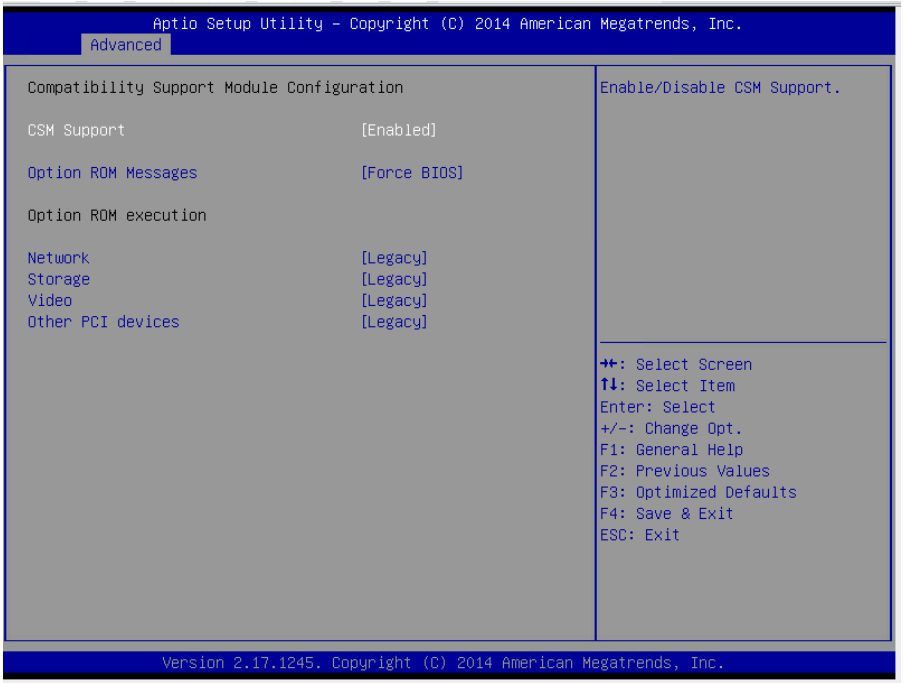
3.3.9.2 PCI Express Gen2 settings

ARI Forwarding

If supported by hardware and set to 'Enabled', the downstream Port disables its traditional. Device Number field being 0 enforcement when turning a type1 configuration request into a type0 configuration request permitting access to extended functions in an ARI Device immediately below the port.

Enabled **/ Disabled**

3.3.10 CSM Configuration



CSM support
Enable/Disable CSM Support
Enabled / Disabled

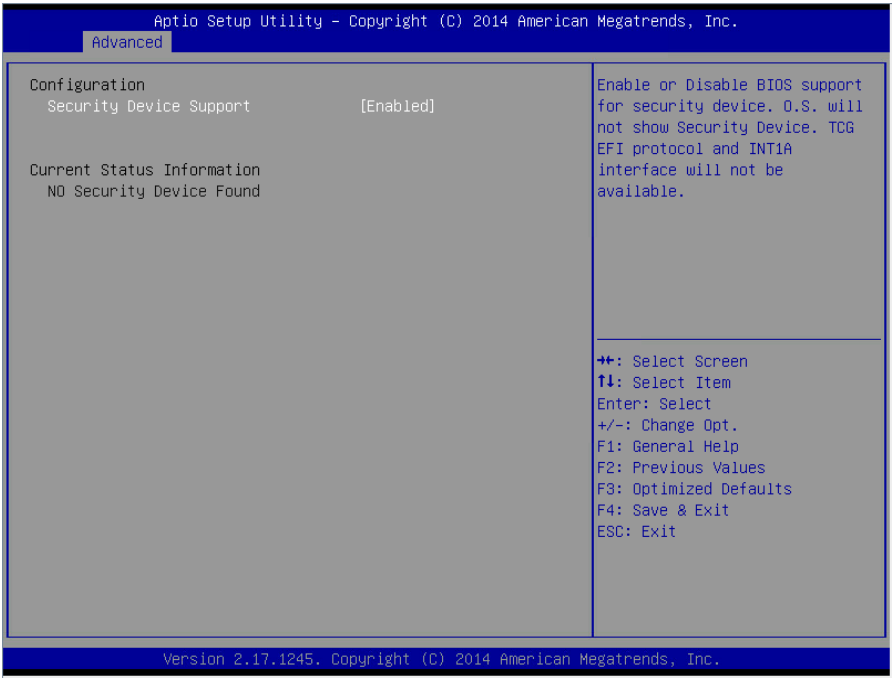
Option ROM Messages
Set display mode for Option ROM
Force BIOS / Keep Current

Network
Controls the execution of UEFI and legacy PXE OpROM
Do not launch / UEFI / **legacy**
Storage
Controls the execution of UEFI and legacy PXE OpROM
Do not launch / UEFI / **legacy** /
Video
Controls the execution of UEFI and legacy PXE OpROM
Do not launch / UEFI / **legacy**

Other PCI devices
Determines OpRom execution policy for devices other than network, storage, or video

legacy / UEFI

3.3.11 Trusted Computing (optional function)



NOTE: If no TPM chipset is on, the Trusted Computing submenu will not appear.

Security Device Support
Enable or disable BIOS support for security device. O.S. will not show Security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

Enable **/ Disable**

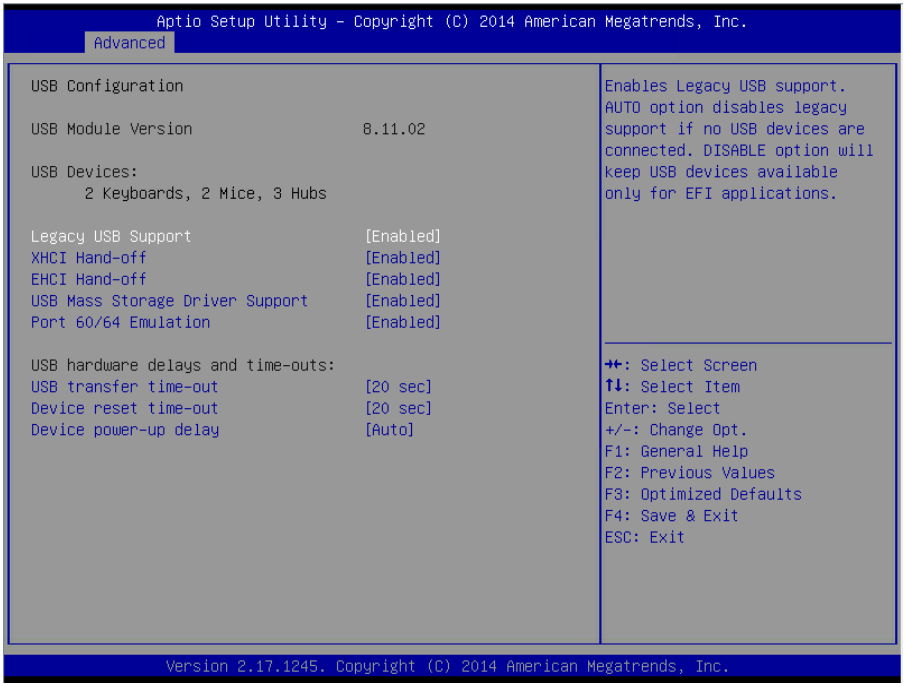
NOTE:
The following BIOS items are available only when **Security Device Support** is set to [Enable].

TPM State
Enable/Disable security Device. NOTE: Your computer will reboot during restart in order to change State of the device.

Enabled **/ Disabled**

Current Status Information
Read only.

3.3.12 USB Configuration



Legacy USB Support
Enable USB legacy support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.

Enabled / Disabled / Auto

XHCI Hand-off

Enabled / Disabled

EHCI Hand-off
This is a workaround for OSes without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.

Enabled / Disabled

USB Mass Storage Driver Support

Enabled / Disabled

Port 60/64 Emulation
Enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.

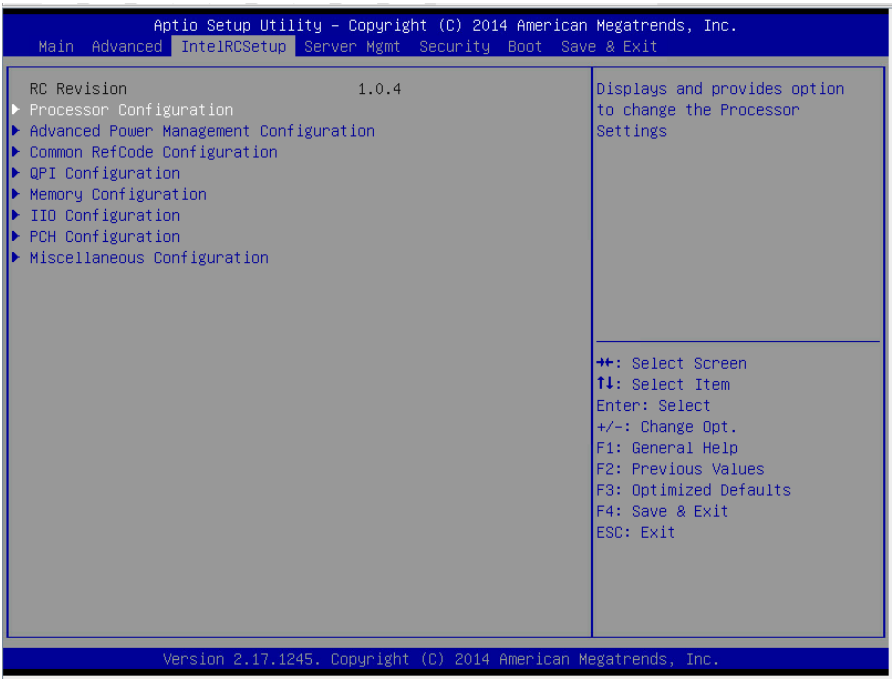
Enabled / Disabled

USB transfer time-out
The time-out value for Control, Bulk and Interrupt transfers.
20 sec / 10 sec / 5 sec / 1 sec

Device reset time-out
USB mass storage device Start Unit command time-out.
20 sec / 10 sec / 30 sec / 40 sec

Device power-up delay
Maximum time the device will take before it properly reports itself to the Host Controller. AUTO uses default value: for a Root port it is 100 ms, for a Hub port the delay is taken from Hub descriptor.
Auto / Manual

3.4 Intel RCSetup Menu



Processor Configuration
Processor Parameters.

Advanced Power Management Configuration
Advanced power management Parameters.

Common RefCode Configuration
Common RefCode Configuration.

QPI Configuration
QPI Configuration

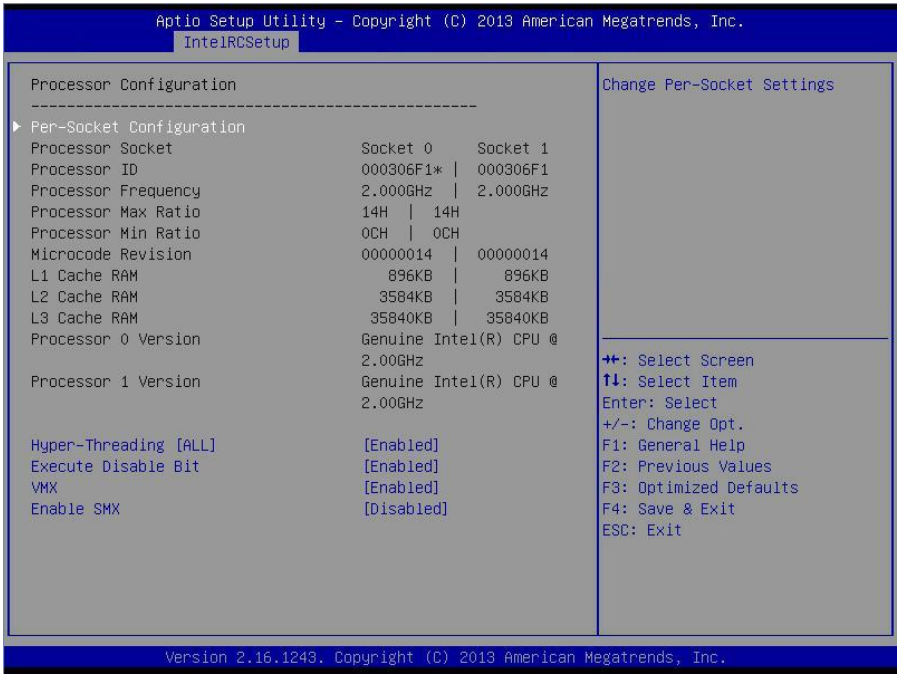
Memory Configuration
Memory Configuration

I/O Configuration (I/O Configuration**)**

PCH Configuration (PCH Configuration**)**

Miscellaneous Configuration (Miscellaneous Configuration**)**

3.4.1 Processor Configuration



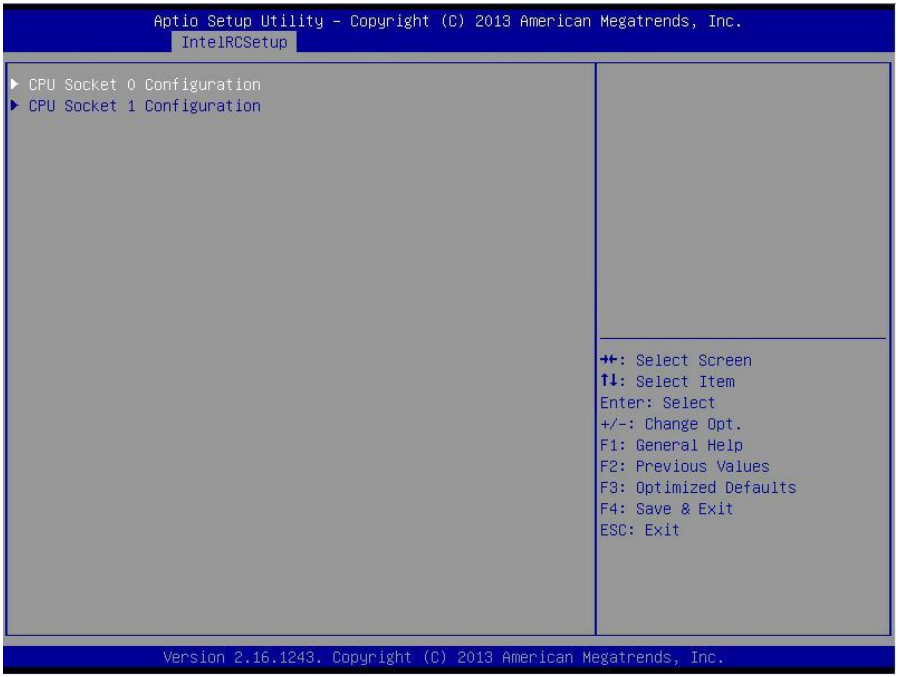
Hyper Threading (ALL)
Enabled for Windows XP and Linux (OS optimized for Hyper Threading Technology) and disabled for other OS (OS not optimized for Hyper Threading Technology). When disabled only one thread
Enabled / Disabled

Execute Disable Bit
XD can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS (Windows Server 2003 SP1, Windows XP SP2, SuSE Linux 9.2, RedHat Enterprise 3 Update 3).
Enabled / Disabled

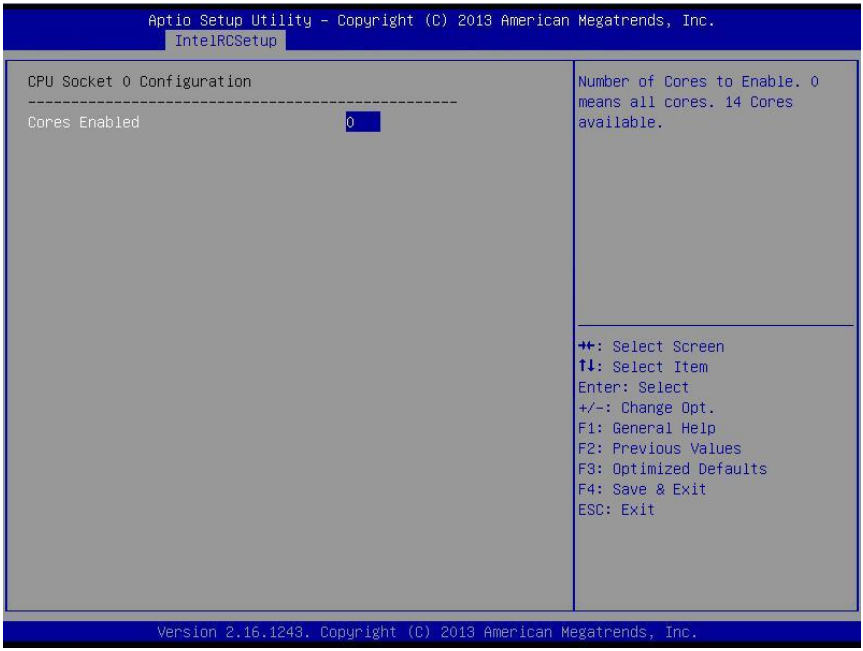
VMX
Enables the Vanderpool Technology, takes effect after reboot
Enabled / Disabled

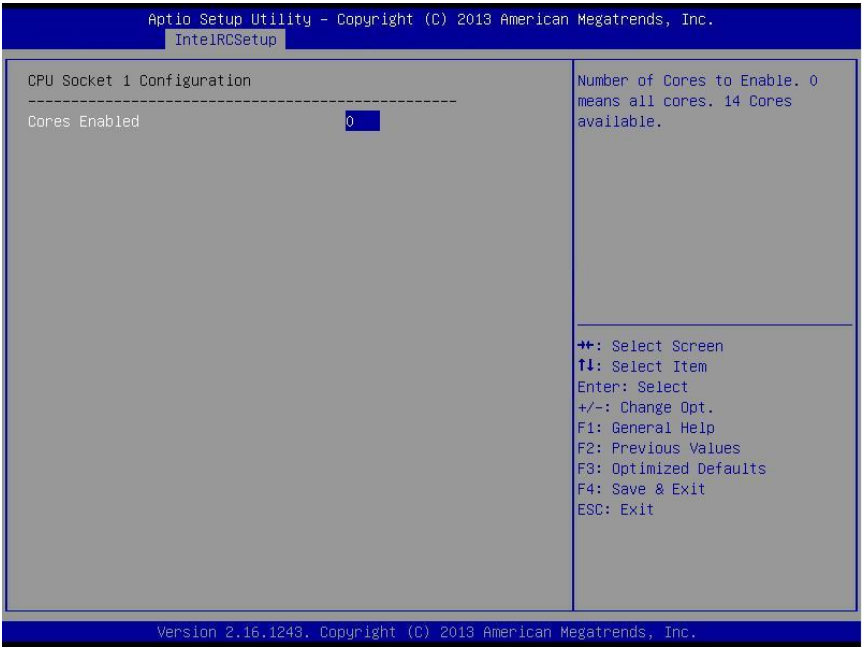
Enable SMX
Enables Safer Mode Extensions.
Enabled **/ Disabled**

3.4.1.1 CPU Socket0/1 Configuration

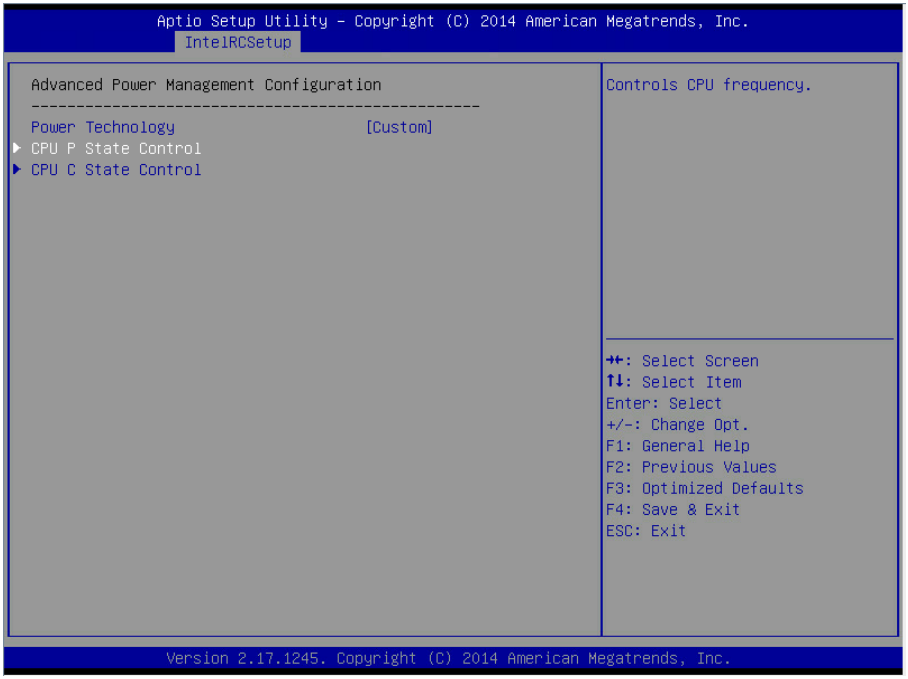


Read only


Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
IntelRCSetup
CPU Socket 0 Configuration
Cores Enabled
0
Number of Cores to Enable. 0 means all cores. 14 Cores available.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.16.1243. Copyright (C) 2013 American Megatrends, Inc.


Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
IntelRCSetup
CPU Socket 1 Configuration
Cores Enabled
0
Number of Cores to Enable. 0 means all cores. 14 Cores available.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.16.1243. Copyright (C) 2013 American Megatrends, Inc.

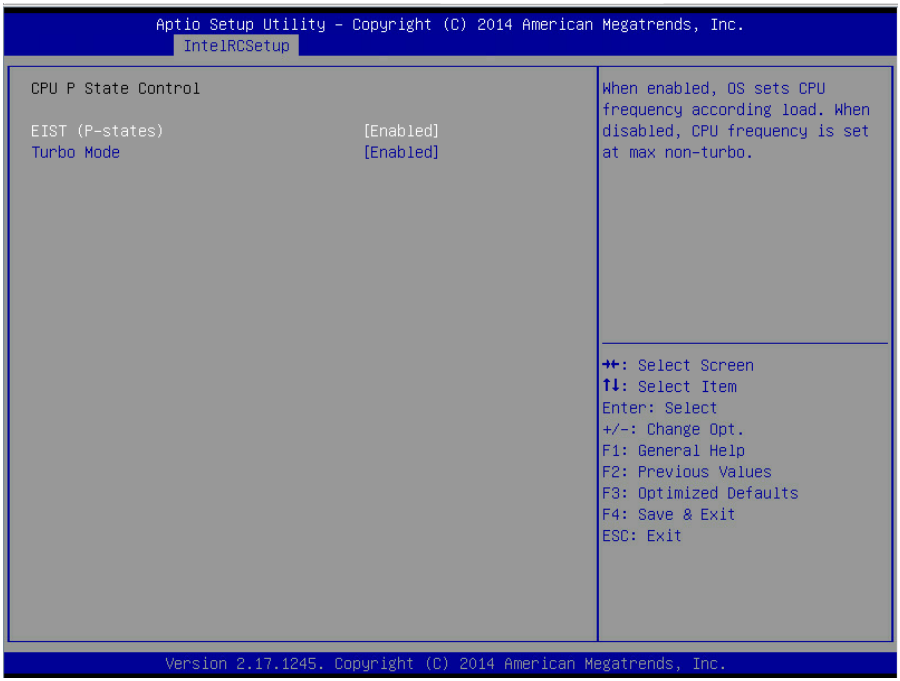
3.4.2 Advanced Power Management Configuration



Power Technology
Enable the power management features.
Custom / Disabled / Energy Efficient

NOTE:
The following BIOS items are available only when **Power Technology** is set to [**Custom**].

3.4.2.1 CPU P State Control



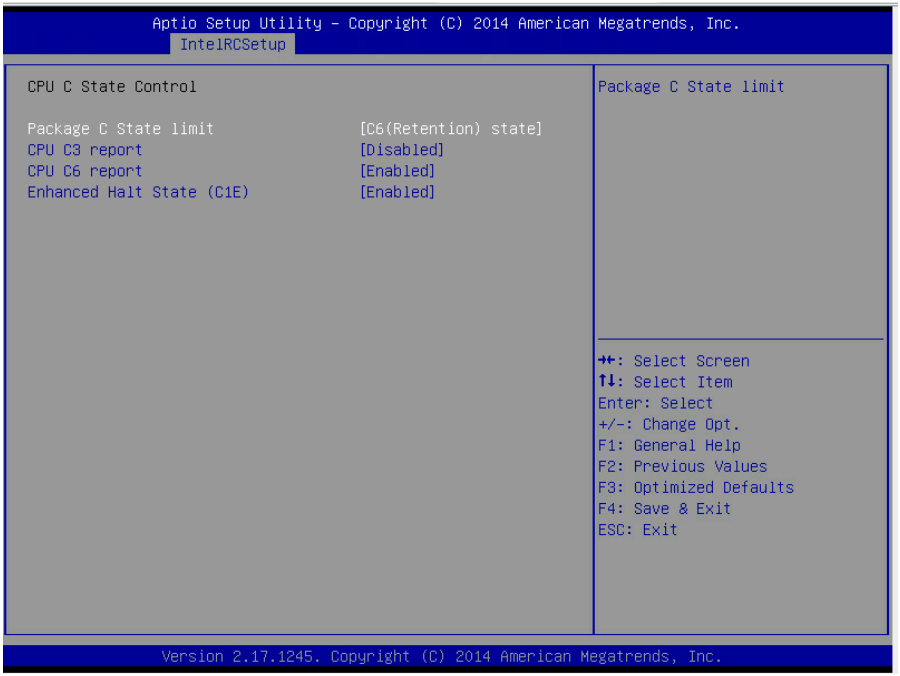
EIST (P-states)
When enabled,OS sets CPU frequency according load. When disabled, CPU frequency is set at max non-turbo.

Enabled / Disabled

Turbo Mode
Turbo mode allows a CPU logical processor to execute a higher frequency when Enough power is available not exceed CPU defined limits.

Enabled / Disabled

3.4.2.2 CPU C State Control



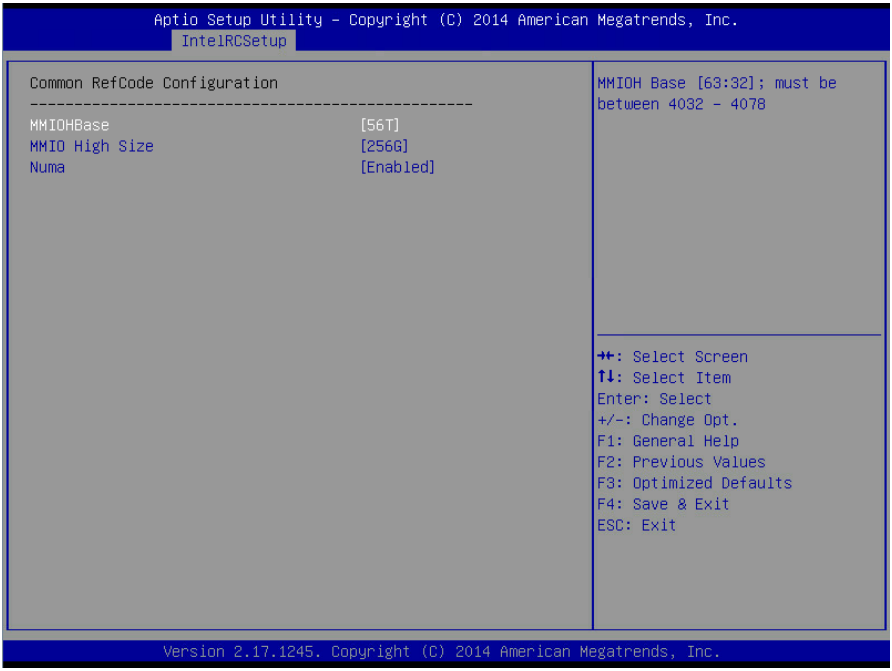
Package C State Limit
C0/C1 state / C2 state / C6 (non Retention) state / **C6 (Retention State)**

CPU C3 Report
Enable/Disable CPU C3 (ACPI C2) report to OS. Recommended to be disabled
Enabled **/ Disabled**

CPU C6 Report
Enable/Disable CPU C6 (ACPI C3) report to OS.
Enabled / Disabled

Enhanced Halt State
Enables the Enhanced C1E state of the CPU, takes effect after reboot
Enabled / Disabled

3.4.3 Common RefCode Configuraion

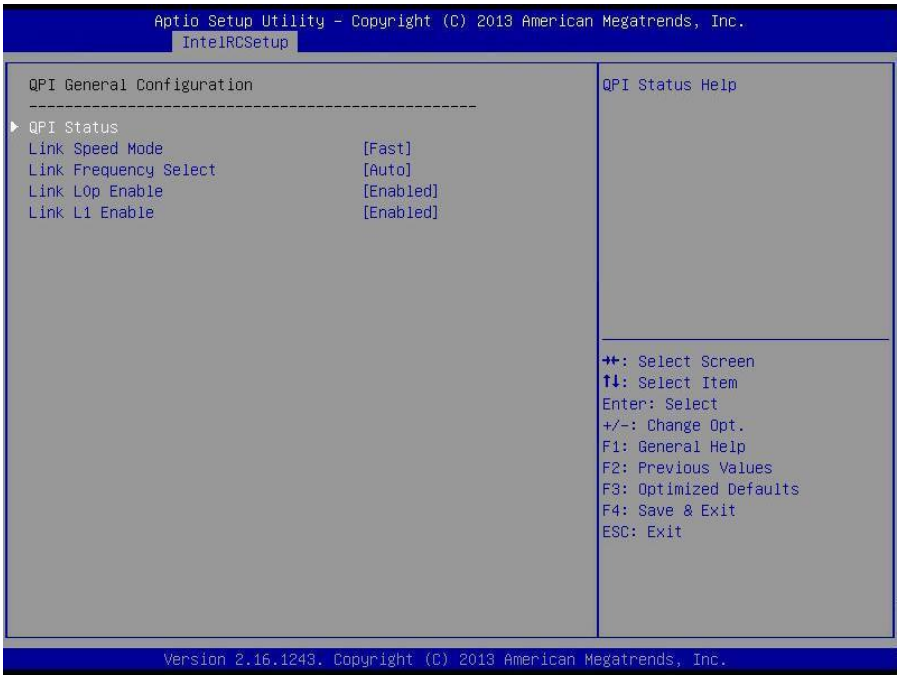


MMIOHBase
MMIOH Base [63:32]; must be between 4032 - 4078
56T / 48T / 24T

MMIO High Size
Select MMIO High Size
256G /128G / 512G /1024G

Numa
Enable or Disable none uniform Memory Access. (NUMA)
Enabled / Disabled

3.4.3 QPI Configuration Submenu



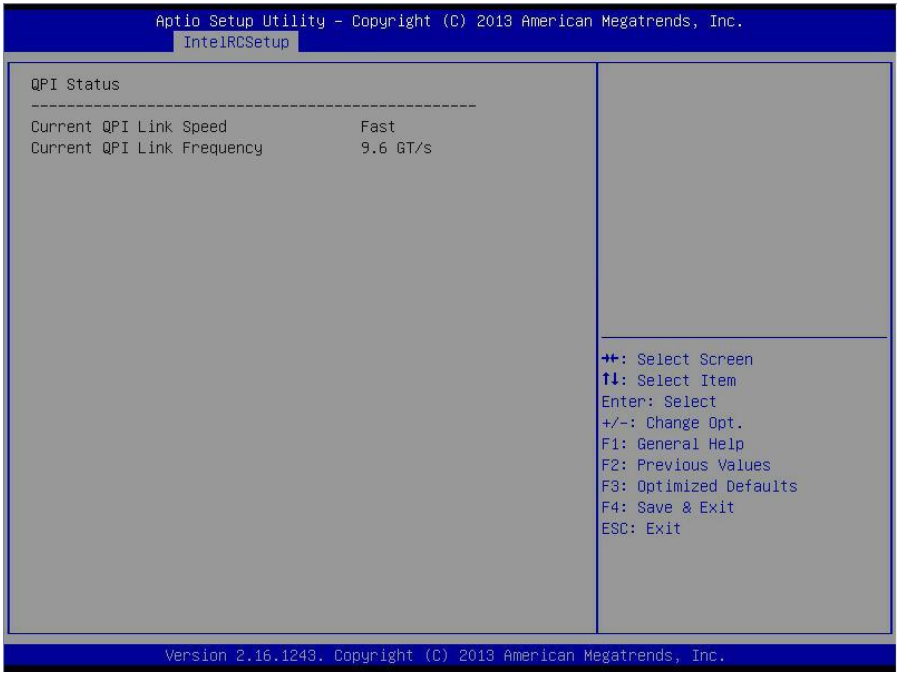
QPI Link Speed Mode
Select the QPI link speed as either the Fast Mode or the Slow Mode.
Fast / Slow

QPI Link Frequency Select
Select the QPI Link Frequency.
Auto / 6.4GT/s / 9.6GT/s / 8.0GT/s / Auto Limited

Link L0p Enable
Link L0p Enable: Disable, Enable, Auto (default)
Enabled / Disabled

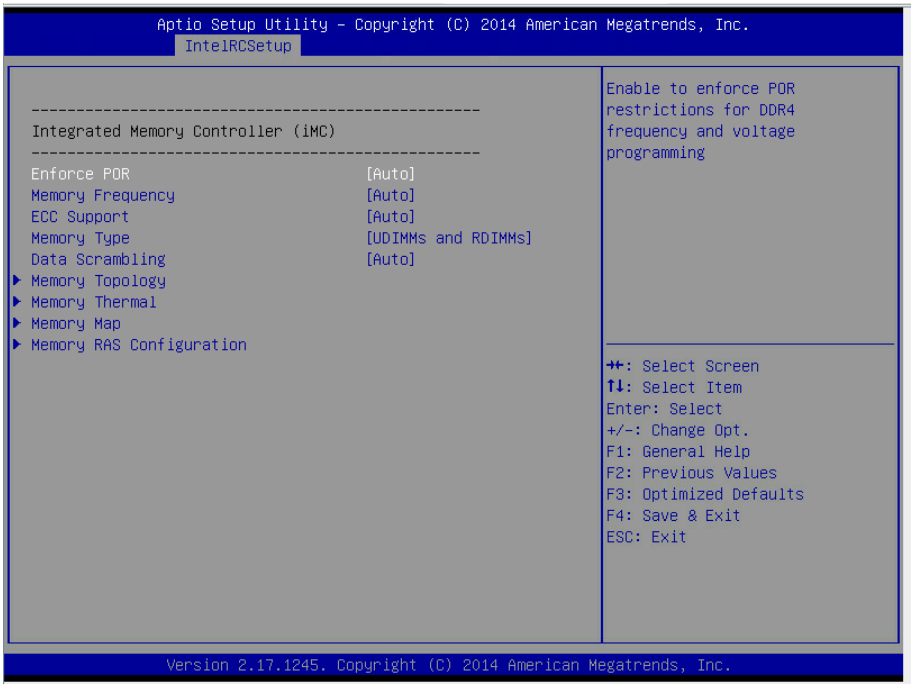
Link L1 Enable
Link L1 Enable: Disable, Enable, Auto (default)
Enabled / Disabled

3.4.3.1 QPI Status Submenu



Read only

3.4.4 Memory Configuration



Enforce POR
Enable to enforce POR restrictions for DDR frequency and voltage programming
Auto / Enforce POR / Disabled / Enforce Stretch Goals

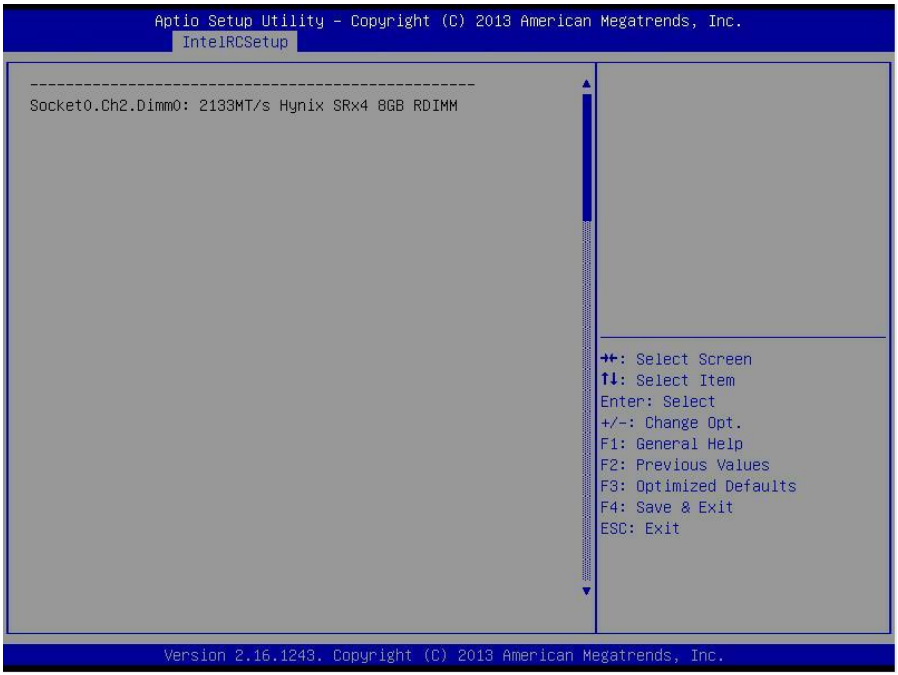
Memory Frequency
Maximum Memory Frequency Selections in Mhz. Do not select Reserved
Auto / 1333 / 1400 / 1600 / 1800 /1867 / 2000 / 2133 / 2200 / 2400 / 2600 /2667 / Reserved / Reserved / Reserved / Reserved

ECC Support
Select the memory type supported by this platform.
Auto / Disabled **/** Enabled

Memory Type
RDIMMs only / UDIMMs only / **UDIMMs and RDIMMs**

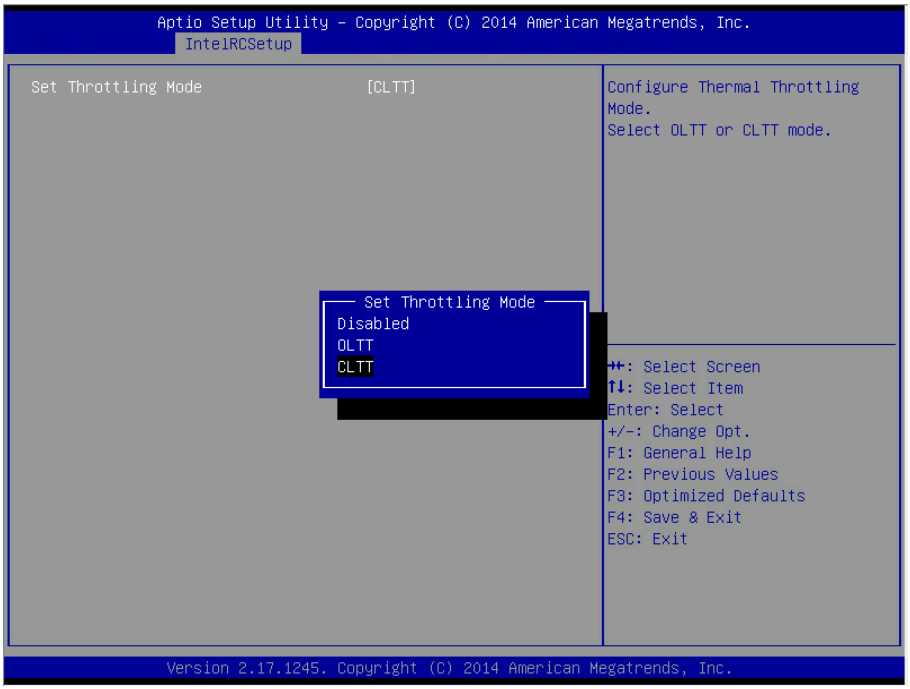
Data Scrambling
Enables Data Scrambling
Auto / Disabled **/** Enabled

3.4.4.1 Memory Topology Configuration



Read only

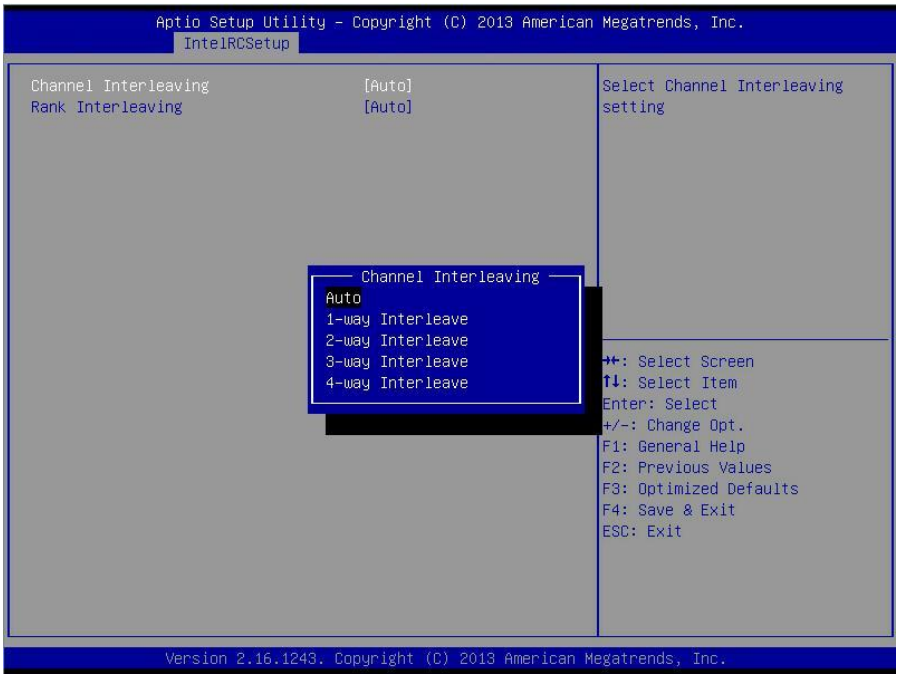
3.4.4.2 Memory Thermal Configuration



Set Throttling Mode
Configure Thermal throttling mode. Select OLTT or CLTT mode.

Disabled / CLTT / OLTT

3.4.4.3 Memory Map Configuration



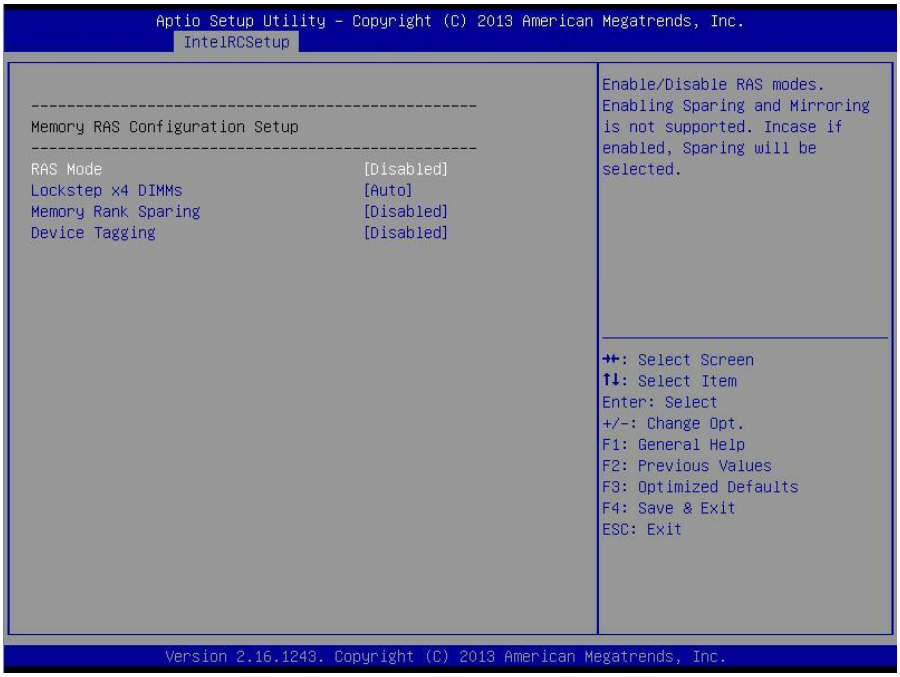
Channel Interleaving
Select Channel Interleaving setting

> **Auto /** 1-way Interleave / 2-way Interleave / 3-way Interleave / 4-way Interleave

Rank Interleaving
Select rank Interleaving setting

> **Auto /** 1-way Interleave / 2-way Interleave / 4-way Interleave / 8-way Interleave

3.4.4.4 Memory RAS Configuration



RAS Mode
Enable / Disable RAS modes. Enabling Sparing and Mirroring is not supported. Incase if enabled, sparing will be selected.

Disabled / Mirror / Lockstep Mode

Lockstep x4 DIMMs
Enable / Disable Lockstep for x4 DIMMs

Auto / Disabled / Enabled

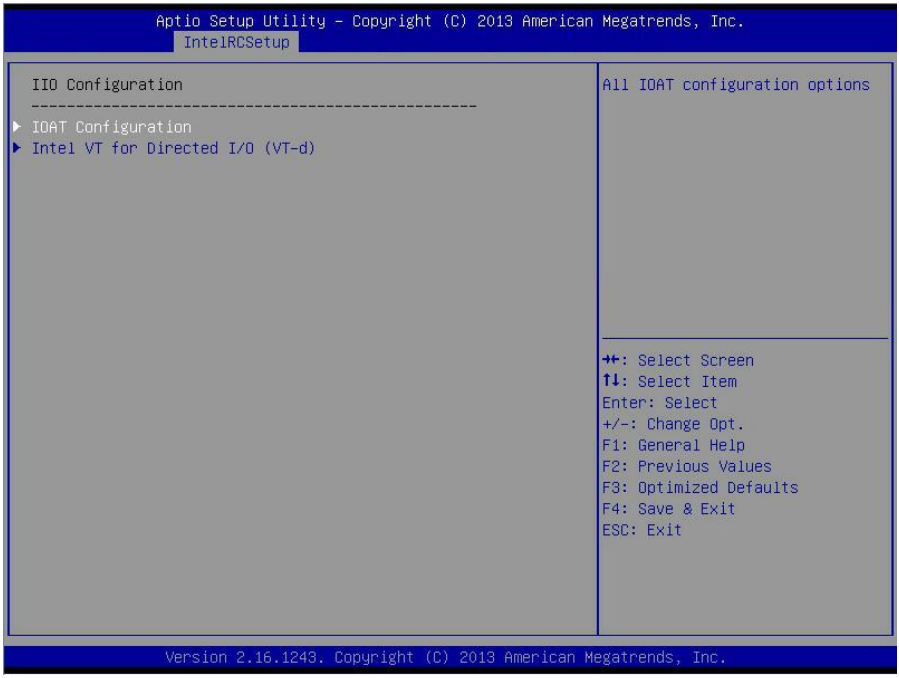
Memory Rank Sparing
Enable / Disable Memory Rank Sparing

Disabled / Enabled

Device Tagging
Enable / Disable Device Tagging

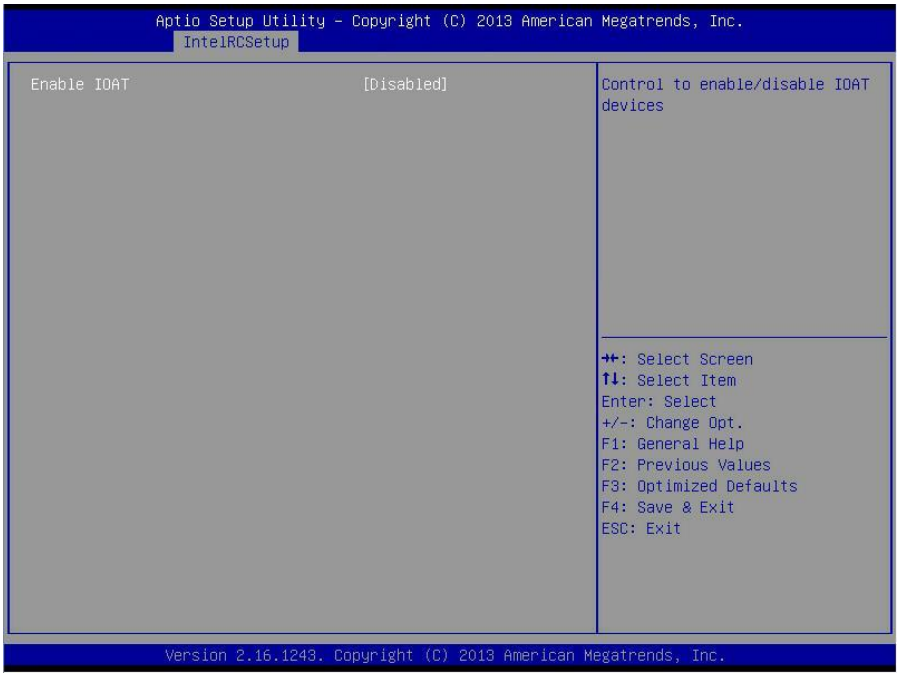
Disabled / Enabled

3.4.5 I/O Configuration Submenu



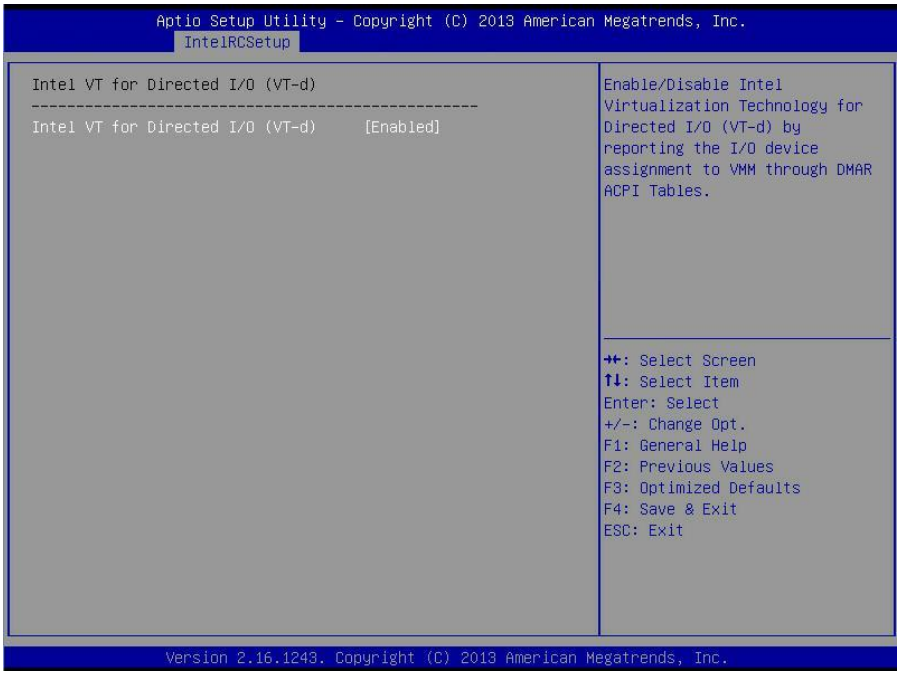
Read only

3.4.5.1 IOAT Configuration Submenu



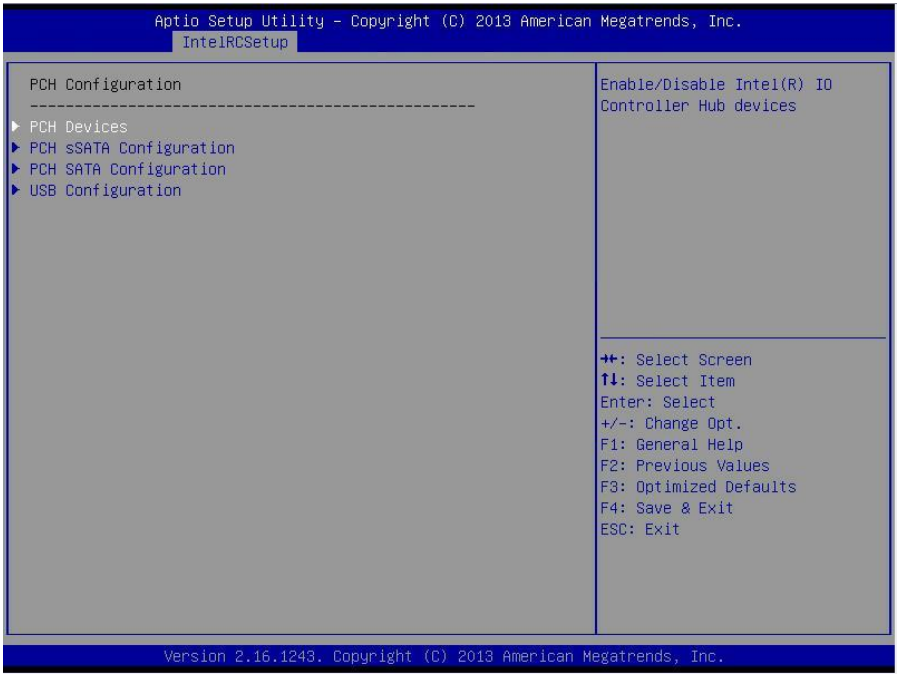
Enable IOAT
Control to enable / disable IOAT devices
Disabled / Enabled

3.4.5.2 Intel® VT for Directed I/O Configuration Submenu

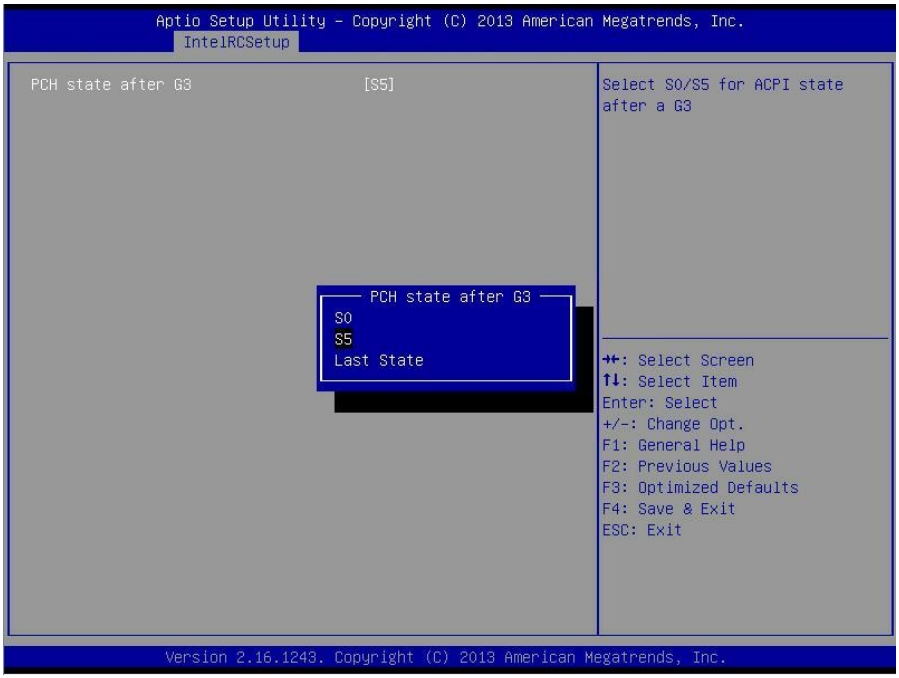


Intel® VT for directed I/O (VT-d)
Enable/Disable Intel® I/O Acceleration Technology (I/OAT).
Disabled **/ Enabled**

3.4.6 PCH Configuration

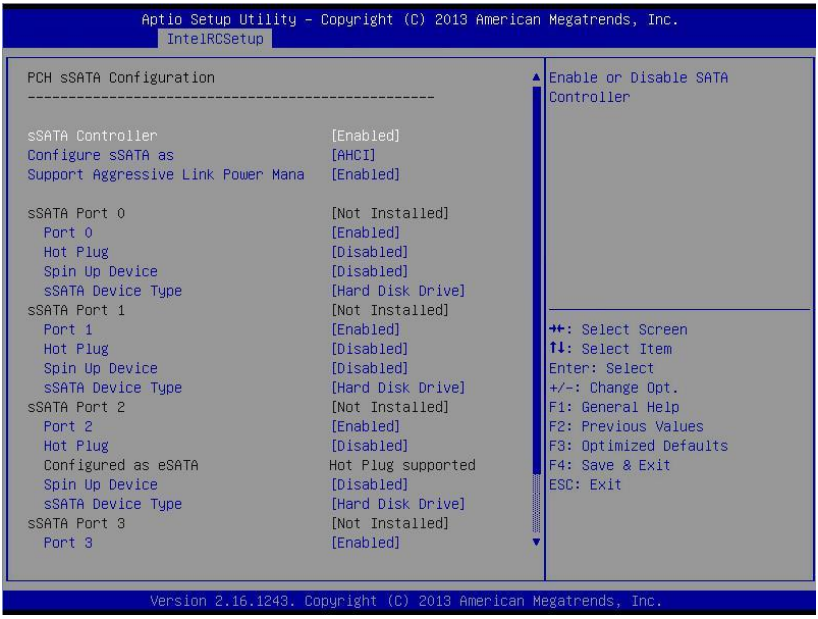


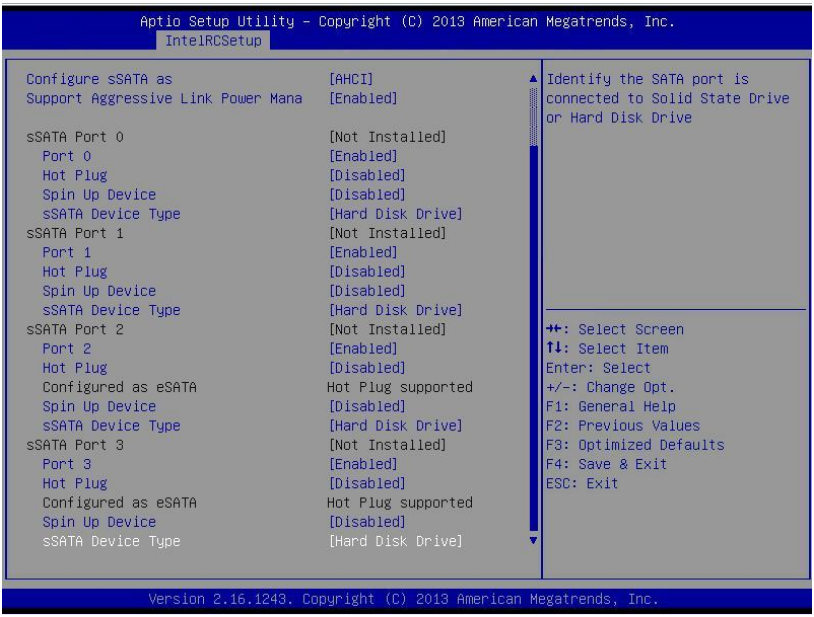
3.4.6.1 PCH Devices Configuration



PCH State after G3
Select S0/S5 for ACPI state after a G3.
S0 **/ S5** / Last State

3.4.6.2 PCH sSATA Configuration





sSATA Controller
Enable or Disable SATA Controller
Disabled **/ Enabled**

Configure sSATA as
Indentify the SATA port is connected to Solid State Drive or Hard Disk Drive
IDE **/ AHCI** / RAID

Support Aggressive Link Power Mana
Enable or Disable Aggressive Link Power Mana
Disabled **/ Enabled**

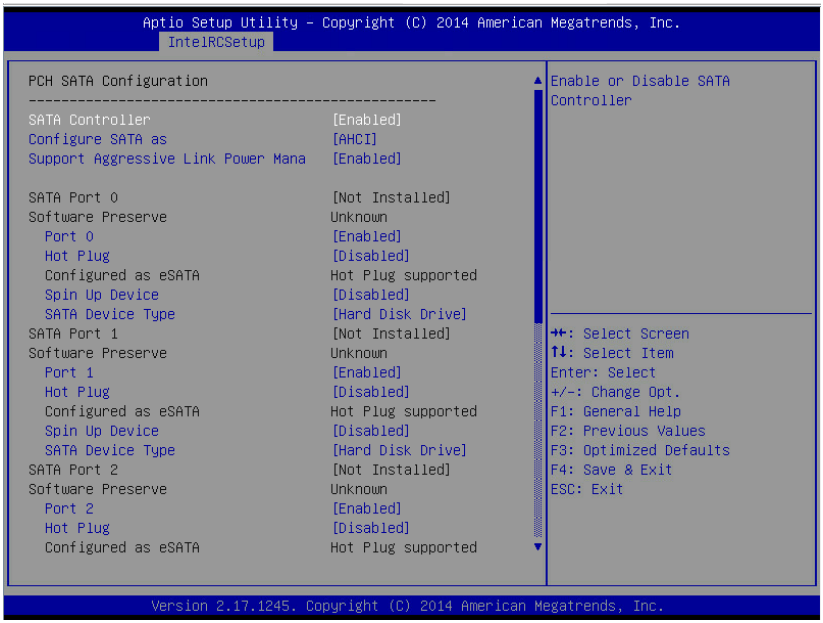
sSATA Port 0/1/2/3
Port 0/1/2/3
Disabled **/ Enabled**

Hot Plug
Enable/Disable SATA Ports Hot Plug Support.
Disabled / Enabled

Spin Up Device
AHCI Supports Staggered Spin-up
Disabled / Enabled

sSATA Device Type
Indentify the SATA port is connected to Solid State Drive or Hard Disk Drive
Hard Disk Drive / Solid State Drive

3.4.6.3 PCH SATA Configuration



SATA Controller
Enable or Disable SATA Controller
Disabled **/ Enabled**

Configure SATA as
Indentify the SATA port is connected to Solid State Drive or Hard Disk Drive
IDE **/ AHCI** / RAID

Support Aggressive Li
Enable or Disable Aggressive Li
Disabled **/ Enabled**

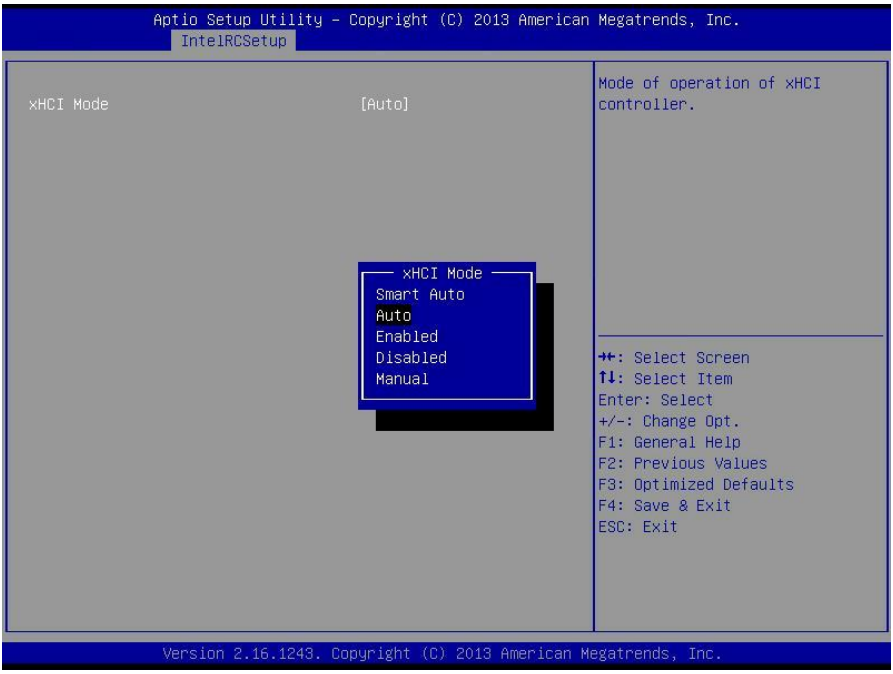
SATA Port 0/1/2/3/4/5
Port 0/1/2/3
Disabled **/ Enabled**

Hot Plug
Enable/Disable SATA Ports Hot Plug Support.
Disabled / Enabled

Spin Up Device
AHCI Supports Staggered Spin-up
Disabled / Enabled

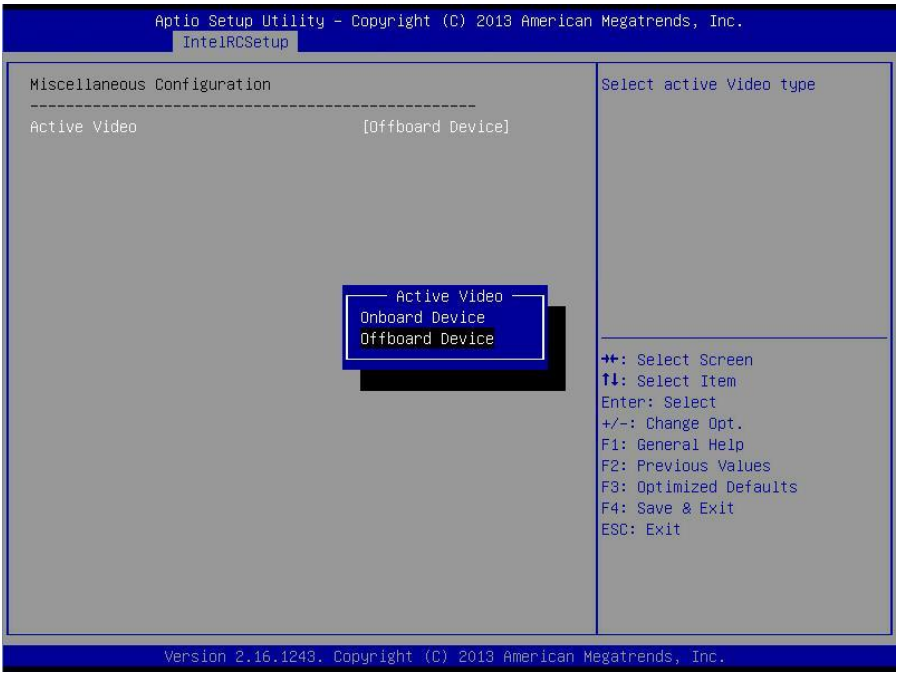
SATA Device Type
Indentify the SATA port is connected to Solid State Drive or Hard Disk Drive
Hard Disk Drive / Solid State Drive

3.4.6.4 USB Configuration



xHCI Mode
Mode of operation of xHCI controller.
Auto / Smart Auto / Enabled / Disabled / Manual

3.4.7 Miscellaneous Configuration

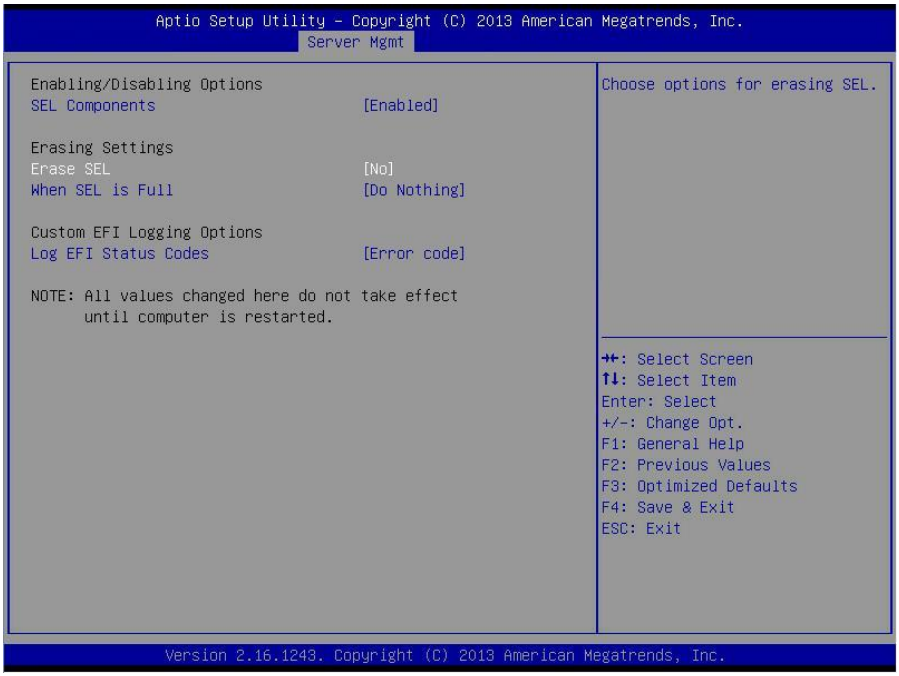


Active Video
Select active video type
Onboard Device / **Offboard Device**

3.5 Server Management

Press <Enter> to change the SEL configuration.
Enable/Disable interfaces to communicate with BMC.

3.5.1 System Event Log



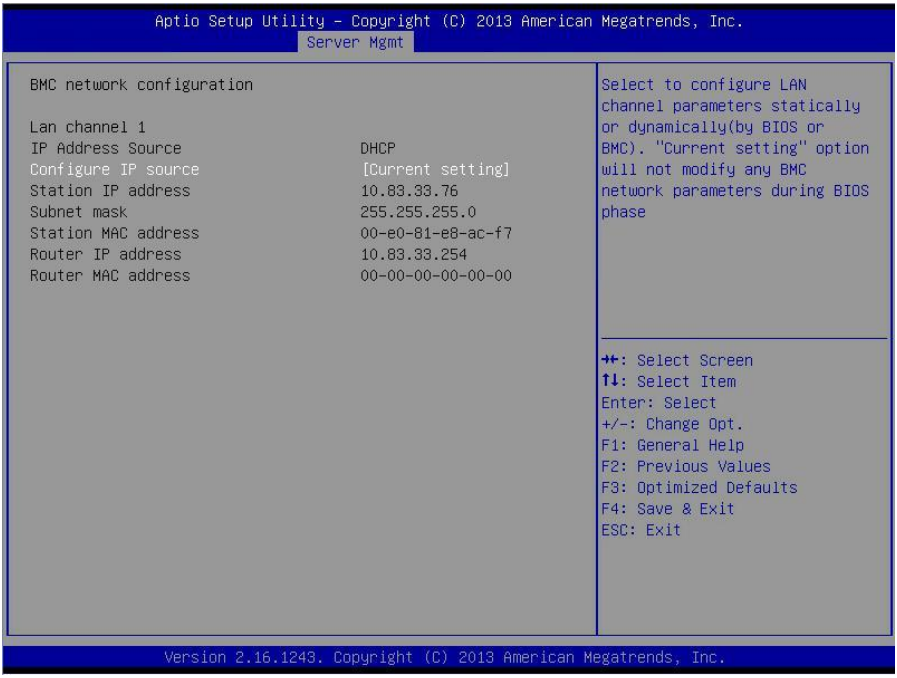
SEL Components
Change this to enable or disable all features of System Event Logging during boot.
Disabled **/ Enabled**

Erase SEL
Choose options for erasing SEL.
No / Yes, on next reset / No, on every reset

When SEL is Full
Choose options for reactions to a full SEL.
Do Nothing / Erase Immediately

Log EFI Status Codes
Disable the logging of EFI Status Codes or log only error code or only progress code or both.
Both **/** Disabled / **Error Code** / Progress Code

3.5.2 BMC Network Configuration

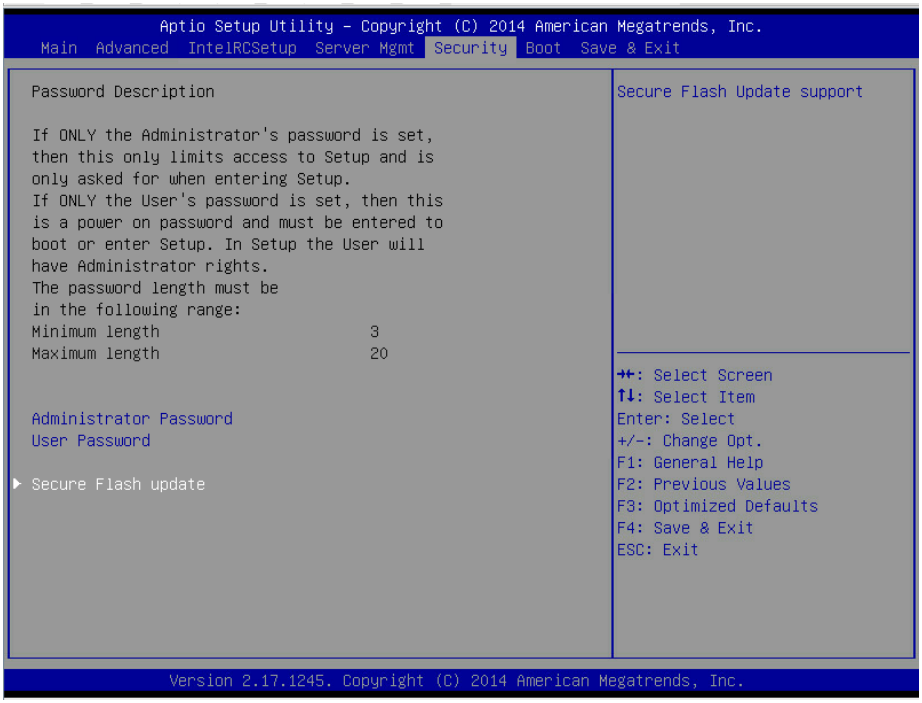


Configuration Address Source

Select the configure LAN channel parameters statically or dynamically (by BIOS or BMC). Unspecified option will not modify any BMC network parameters during BIOS phase.

Current Setting / Static / Dynamic-Obtained by BMC

3.6 Security

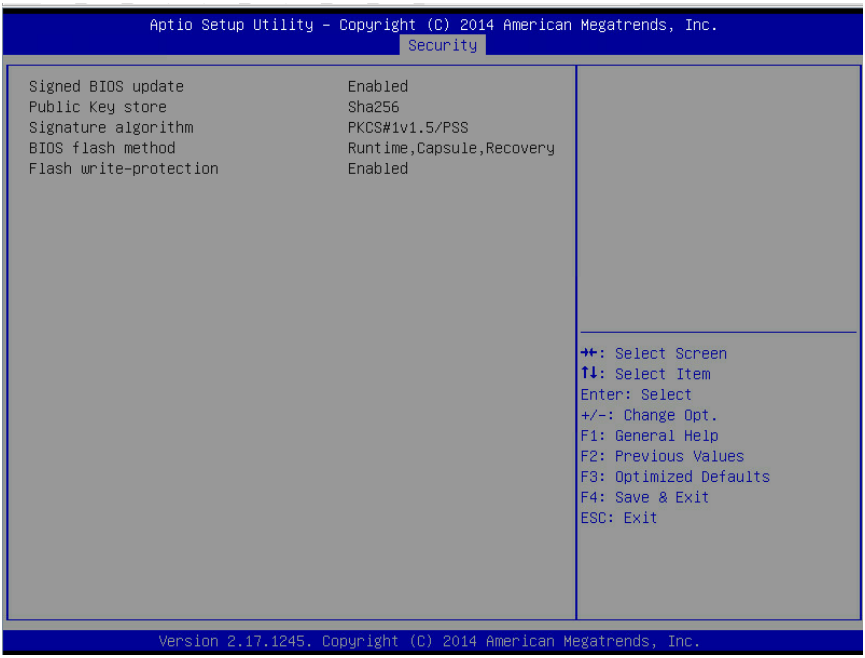


Password Description
Read only.

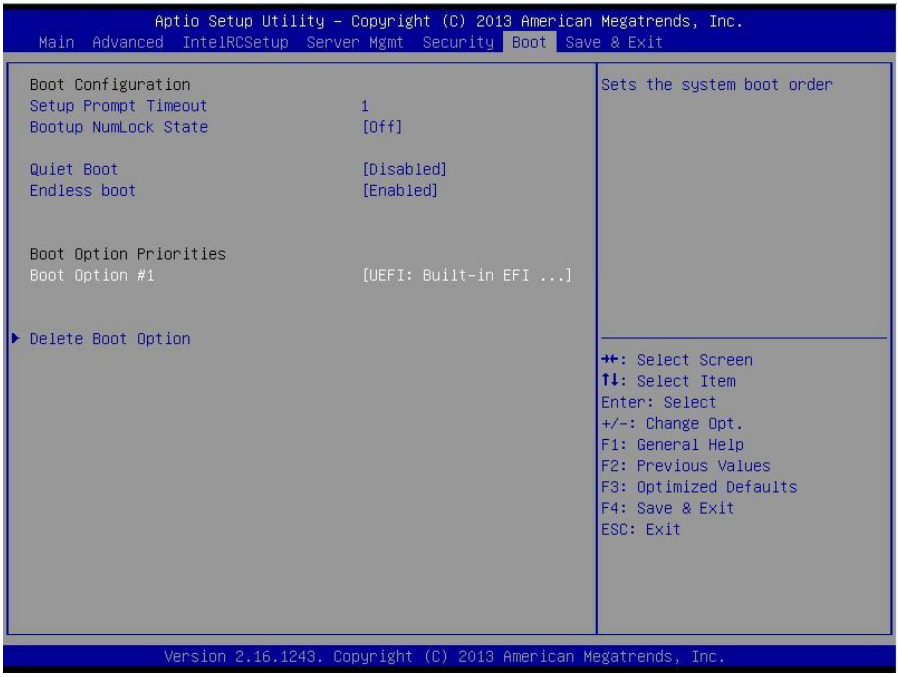
Administrator Password
Install or change the password.

User Password
Install or change the password.

3.6.1 Security Flash update Configuration



3.7 Boot



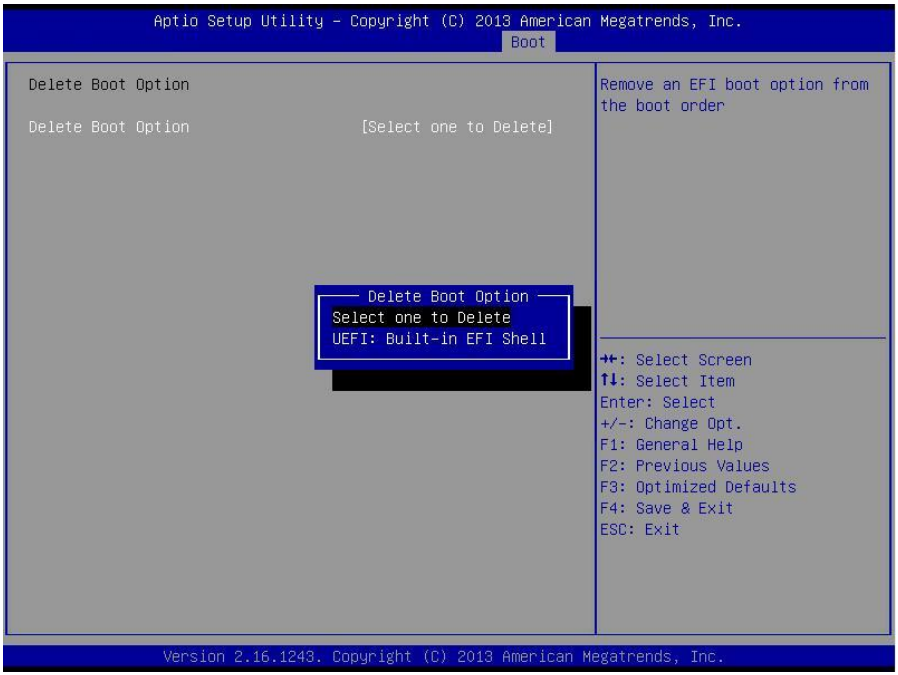
Bootup NumLock State
Select the keyboard NumLock state.
Off / On

Quiet Boot
Enable or disable Quiet Boot option.
Disabled / Enabled

Endless Boot
Enable or disable Endless Boot.
Disabled **/ Enabled**

Boot Option #1/Boot Option #2
Select the first boot device.
Device Name / Disabled

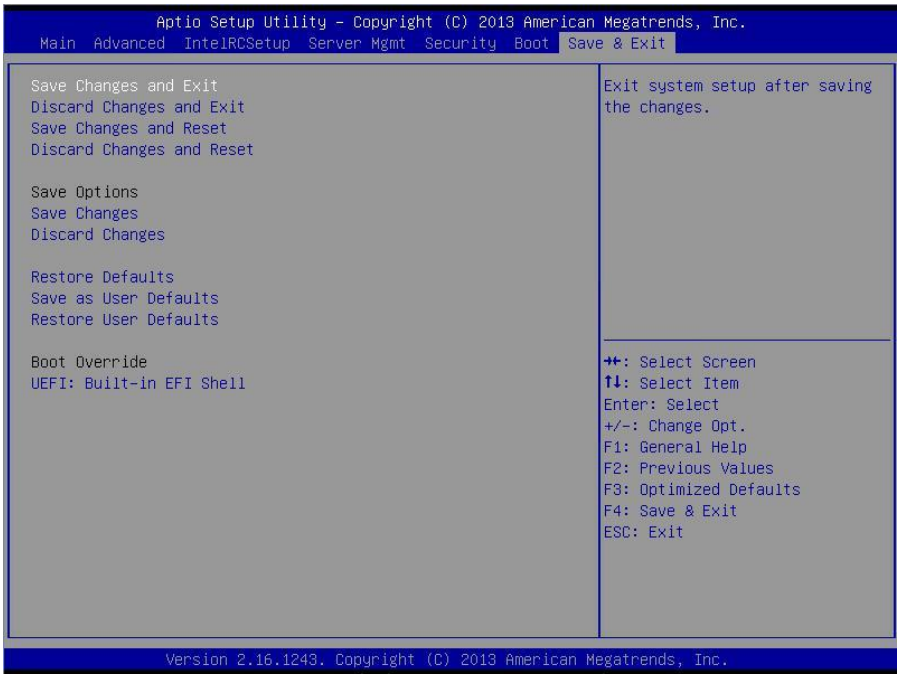
3.7.1 Delete Boot Option Configuration



Delete Boot Option #1
Sets the system boot order.

Device Name / Select one to Delete

3.8 Save & Exit



Save Changes and Exit
Exit system setup after saving the changes.

Discard Changes and Exit
Exit system setup without saving any changes.

Save Changes and Reset
Reset the system after saving the changes.

Discard Changes and Reset
Reset system setup without saving any changes.

Save Options
Read only.

Save Changes
Save changes done so far to any of the setup options.

Discard Changes
Discard changes done so far to any of the setup options.

Restore Defaults
Restore/Load Default values for all the setup options.

Save as User Defaults
Save the changes done so far as User Defaults.

Restore User Defaults
Restore the User Defaults to all the setup options.

Chapter 4: Diagnostics

NOTE: if you experience problems with setting up your system, always check the following things in the following order:

Memory, Video, CPU

By checking these items, you will most likely find out what the problem might have been when setting up your system. For more information on troubleshooting, check the TYAN website at http://www.tyan.com.

4.1 Flash Utility

Every BIOS file is unique for the motherboard it was designed for. For Flash Utilities, BIOS downloads, and information on how to properly use the Flash Utility with your motherboard, please check the TYAN web site at http://www.tyan.com

NOTE: Please be aware that by flashing your BIOS, you agree that in the event of a BIOS flash failure, you must contact your dealer for a replacement BIOS. There are no exceptions. TYAN does not have a policy for replacing BIOS chips directly with end users. In no event will TYAN be held responsible for damages done by the end user.

4.2 AMIBIOS Post Code (Aptio)

The POST code checkpoints are the largest set of checkpoints during the BIOS pre-boot process. The following table describes the type of checkpoints that may occur during the POST portion of the BIOS:

Checkpoint Ranges

Status Code Range	Description
0x01 – 0x0B	SEC execution
0x0C – 0x0F	Sec errors
0x10 – 0x2F	PEI execution up to and including memory detection
0x30 – 0x4F	PEI execution after memory detection
0x50 – 0x5F	PEI errors
0x60 – 0x8F	DXE execution up to BDS
0x90 – 0xCF	BDS execution
0xD0 – 0xDF	DXE errors
0xE0 – 0xE8	S3 Resume (PEI)
0xE9 – 0xEF	S3 Resume errors (PEI)
0xF0 – 0xF8	Recovery (PEI)
0xF9 – 0xFF	Recovery errors (PEI)

Standard Checkpoints

SEC Phase

Status Code	Description
0x00	Note used
Progress Codes	
0x01	Power on. Reset type detection (soft/hard).
0x02	AP initialization before microcode loading
0x03	North Bridge initialization before microcode loading
0x04	South Bridge initialization before microcode loading
0x05	OEM initialization before microcode loading
0x06	Microcode loading
0x07	AP initialization after microcode loading
0x08	North Bridge initialization after microcode loading
0x09	South Bridge initialization after microcode loading
0x0A	OEM initialization after microcode loading
0x0B	Cache initialization

SEC Error Codes	
0x0C – 0x0D	Reserved for future AMI SEC error codes
0x0E	Microcode not found
0x0F	Microcode not found

SEC Phase

None

PEI Phase

Status Code	Description
Progress Codes	
0x10	PCI Core is started
0x11	Pre-memory CPU initialization is started
0x12	Pre-memory CPU initialization (CPU module specific)
0x13	Pre-memory CPU initialization (CPU module specific)
0x14	Pre-memory CPU initialization (CPU module specific)
0x15	Pre-memory North Bridge initialization is started
0x16	Pre-Memory North Bridge initialization (North Bridge module specific)
0x17	Pre-memory North Bridge initialization (North Bridge module specific)
0x18	Pre-Memory North Bridge initialization (North Bridge module specific)
0x19	Pre-memory South Bridge initialization is started
0x1A	Pre-Memory South Bridge initialization (South Bridge module specific)
0x1B	Pre-memory South Bridge initialization (South Bridge module specific)
0x1C	Pre-Memory South Bridge initialization (South Bridge module specific)
0x1D – 0x2A	OEM pre-memory initialization codes
0x2B	Memory initialization. Serial Presence Detect (SPD) data reading
0x2C	Memory initialization. Memory presence detection
0x2D	Memory initialization. Programming memory timing information
0x2E	Memory initialization. Configuring memory
0x2F	Memory initialization (other)
0x30	Reserved for ASL (see ASL Status Codes section below)
0x31	Memory Installed
0x32	CPU post-memory initialization is started.
0x33	CPU post-memory initialization. Cache initialization
0x34	CPU post-memory initialization. Application Processor(s) (AP) initialization

Status Code	Description
0x35	CPU post-memory initialization. Boot Strap Processor (BSP) selection
0x36	CPU post-memory initialization. System Management Mode (SMM) initialization
0x37	Post-Memory North Bridge initialization is started.
0x38	Post-Memory North Bridge initialization (North Bridge module specific)
0x39	Post-Memory North Bridge initialization (North Bridge module specific)
0x3A	Post-Memory North Bridge initialization (North Bridge module specific)
0x3B	Post-Memory South Bridge initialization is started
0x3C	Post-Memory South Bridge initialization (South Bridge module specific)
0x3D	Post-Memory South Bridge initialization (South Bridge module specific)
0x3E	Post-Memory South Bridge initialization (South Bridge module specific)
0x3F – 0x4E	OEM post memory initialization codes
0x4F	DXE PIL is started
PCI Error Codes	
0x50	Memory initialization error. Invalid memory type or incompatible memory speed
0x51	Memory initialization error. SPD reading has failed.
0x52	Memory initialization error. Invalid memory size or memory modules do not match.
0x53	Memory initialization error. No usable memory detected
0x54	Unspecified memory initialization error
0x55	Memory not installed
0x56	Invalid CPU type or speed
0x57	CPU mismatch
0x58	CPU self test failed or possible CPU cache error
0x59	CPU microcode is not found or microcode update is failed.
0x5A	Internal CPU error
0x5B	Reset PPI is not available.
0x5C – 0x5F	Reserved for future AMI error codes
S3 Resume Progress Codes	
0xE0	S3 Resume is started (S3 Resume PPI is called by the DXE IPL).
0xE1	S3 Boot Script execution
0xE2	Video repost
0xE3	OS S3 wake vector call
0xE4 – 0xE7	Reserved for future AMI progress codes

Status Code	Description
S3 Resume Error Codes	
0xE8	S3 Resume failed
0xE9	S3 Resume PPI not found
0xEA	S3 Resume Boot Script error
0xEB	S3 OS wake error
0xEC – 0xEF	Reserved for future AMI error codes
Recovery Progress Codes	
0xF0	Recovery condition triggered by firmware (Auto recovery)
0xF1	Recovery condition triggered by user (forced recovery)
0xF2	Recovery process started
0xF3	Recovery firmware image is found.
0xF4	Recovery firmware image is loaded.
0xF5 – 0xF7	Reserved for future AMI progress codes
Recovery Error Codes	
0xF8	Recovery PPI is not available.
0xF9	Recovery capsule is not found.
0xFA	Invalid recovery capsule
0xFB – 0xFF	Reserved for future AMI error codes

PEI Beep Codes

# of Beeps	Description
Progress Codes	
1	Memory not installed
1	Memory was installed twice (installPEIMemory routine in PEI Core called twice).
2	Recovery started
3	DXEIPL was not found.
3	DXE Core Firmware Volume was not found.
4	Recovery failed
4	S3 Resume failed
7	Reset PPI is not available.

DXE Phase

Status Code	Description
0x60	DXE Core is started.
0x61	NVRAM initialization
0x62	Installation of the South Bridge Runtime Services

Status Code	Description
0x63	CPU DXE initialization is started.
0x64	CPU DXE initialization (CPU module specific)
0x65	CPU DXE initialization (CPU module specific)
0x66	CPU DXE initialization (CPU module specific)
0x67	CPU DXE initialization (CPU module specific)
0x68	PCI host bridge initialization
0x69	North Bridge DXE initialization is started.
0x6A	North Bridge DXE SMM initialization is started.
0x6B	North Bridge DXE initialization (North Bridge module specific)
0x6C	North Bridge DXE initialization (North Bridge module specific)
0x6D	North Bridge DXE initialization (North Bridge module specific)
0x6E	North Bridge DXE initialization (North Bridge module specific)
0x6F	North Bridge DXE initialization (North Bridge module specific)
0x70	South Bridge DXE initialization is started.
0x71	South Bridge DXE SMM initialization is started.
0x72	South Bridge devices initialization
0x73	South Bridge DXE initialization (South Bridge module specific)
0x74	South Bridge DXE initialization (South Bridge module specific)
0x75	South Bridge DXE initialization (South Bridge module specific)
0x76	South Bridge DXE initialization (South Bridge module specific)
0x77	South Bridge DXE initialization (South Bridge module specific)
0x78	ACPI module initialization
0x79	CSM initialization
0x7A – 0x7F	Reserved for future AMI DXE codes
0x80 – 0x8F	OEM DXE initialization codes
0x90	Boot Device Selection (BDS) phase is started
0x91	Driver connecting is started
0x92	PCI Bus initialization is started
0x93	PCI Bus Hot Plug Controller initialization
0x94	PCI Bus Enumeration
0x95	PCI BUS Request Resources
0x96	PCI Bus Assign Resources
0x97	Console output devices connect
0x98	Console Input devices connect
0x99	Super IO initialization
0x9A	USB initialization is started.

Status Code	Description
0x9B	USB Reset
0x9C	USB Detect
0x9D	USB Enable
0x9E -0x9F	Reserved for future AMI codes
0xA0	IDE initialization is started
0xA1	IDE Reset
0xA2	IDE Detect
0xA3	IDE Enable
0xA4	SCSI initialization is started.
0xA5	SCSI Reset
0xA6	SCSI Detect
0xA7	SCSI Enable
0xA8	Setup Verifying Password
0xA9	Start of Setup
0xAA	Reserved for ASL (see ASL Status Codes section below)
0xAB	Setup Input Wait
0xAC	Reserved for ASL (see ASL Status Codes section below)
0xAD	Ready To Boot event
0xAE	Legacy Boot event
0xAF	Exit Boot Services event
0xB0	Runtime Set Virtual Address MAP Begin
0xB1	Runtime Set Virtual Address MAP End
0xB2	Legacy Option ROM initialization
0xB3	System Reset
0xB4	USB hot plug
0xB5	PCI bus hot plug
0xB6	Clean-up of NVRAM
0xB7	Configuration Reset (reset of NVRAM settings)
0xB8 – 0xBF	Reserved for future AMI codes
0xC0 – 0xCF	OEM BDS initialization codes
DXE Error Codes	
0xD0	CPU initialization error
0xD1	North Bridge initialization error
0xD2	South Bridge initialization error
0xD3	Some of the Architectural Protocols are not available
0xD4	PCI resource allocation error. Out of Resources

Status Code	Description
0xD5	No Space for Legacy Option ROM
0xD6	No Console Output Devices are found.
0xD7	No Console Input Devices are found.
0xD8	Invalid password
0xD9	Error loading Boot Option (LoadImage returned error)
0xDA	Boot Option is failed (StartImage returned error).
0xDB	Flash update is failed.
0xDC	Reset protocol is not available.

DXE Beep Codes

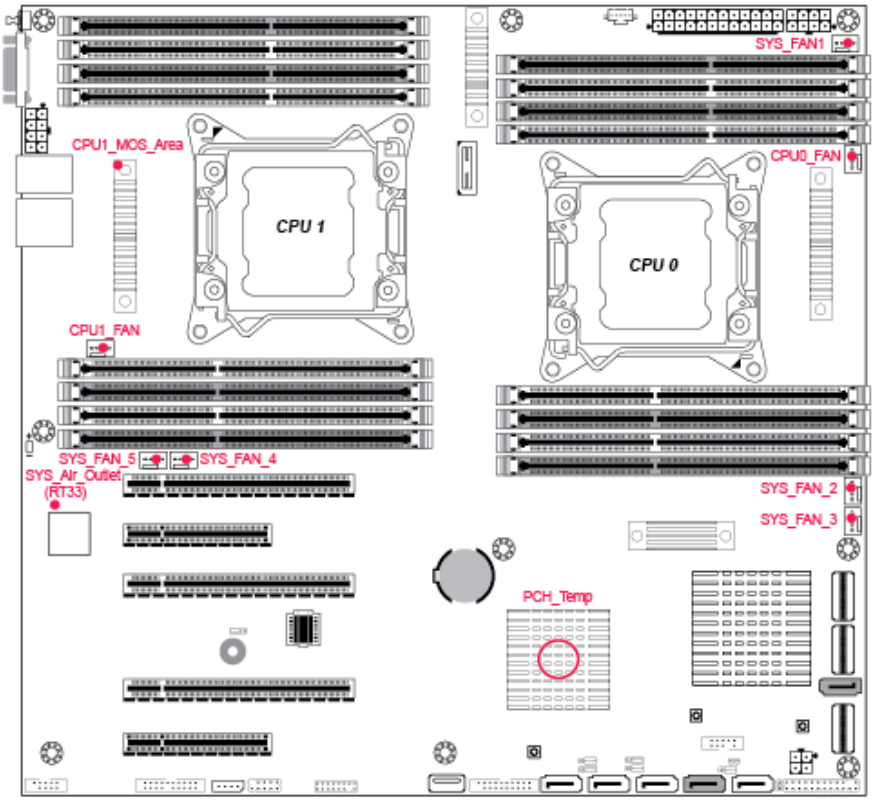
# of Beeps	Description
1	Invalid password
4	Some of the Architectural Protocols are not available.
5	No Console Output Devices are found.
5	No Console Input Devices are found.
6	Flash update is failed.
7	Reset protocol is not available.
8	Platform PCI resource requirements cannot be met.

ACPI/ASL Checkpoints

Status Code	Description
0x01	System is entering S1 sleep state.
0x02	System is entering S2 sleep state.
0x03	System is entering S3 sleep state.
0x04	System is entering S4 sleep state.
0x05	System is entering S5 sleep state.
0x10	System is waking up from the S1 sleep state.
0x20	System is waking up from the S2 sleep state.
0x30	System is waking up from the S3 sleep state.
0x40	System is waking up from the S4 sleep state.
0xAC	System has transitioned into ACPI mode. Interrupt controller is in APIC mode.
0xAA	System has transitioned into ACPI mode. Interrupt controller is in APIC mode.

Appendix I: Fan and Temp Sensors

This section aims to help readers identify the locations of some specific FAN and Temp Sensors on the motherboard. A table of BIOS Temp sensor name explanation is also included for readers' reference.



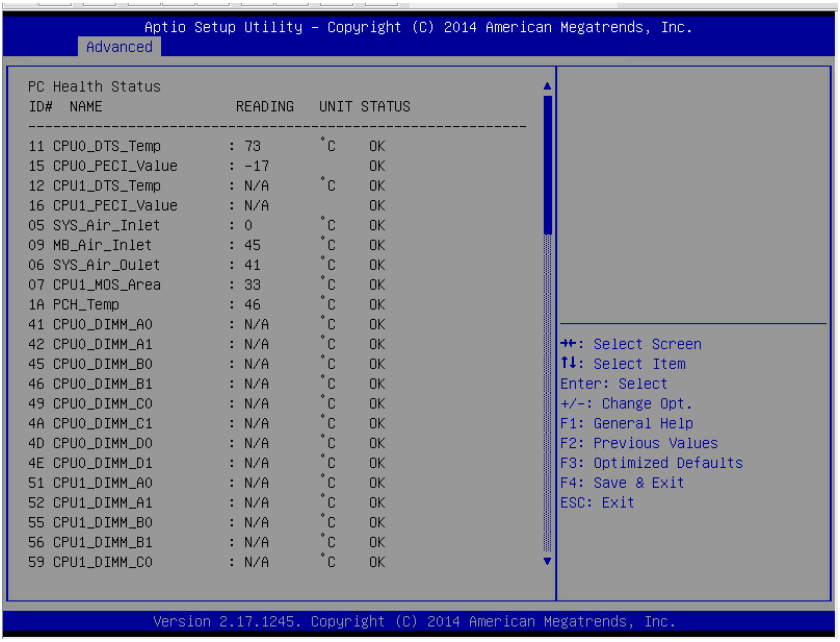
NOTE: The red dot indicates the sensor.

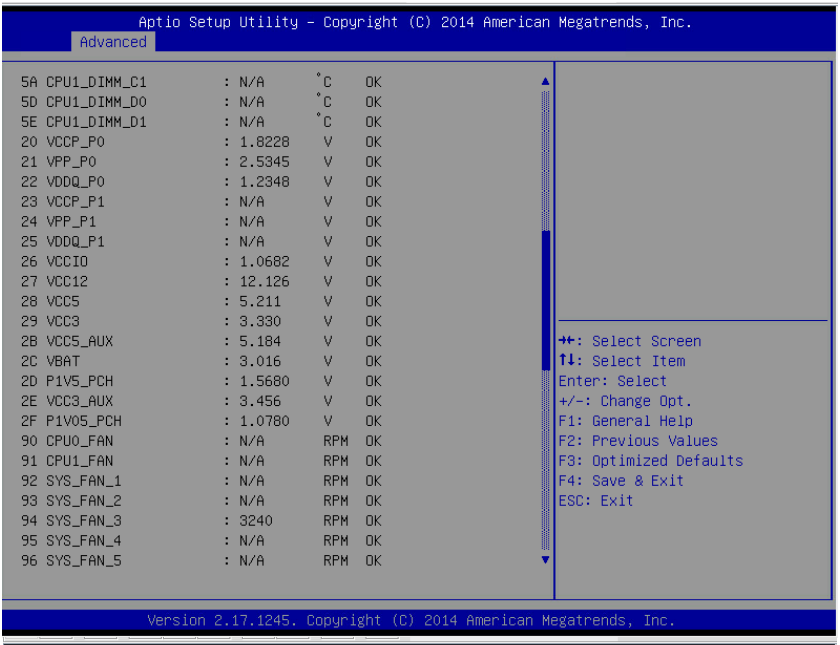
Fan and Temp Sensor Location:

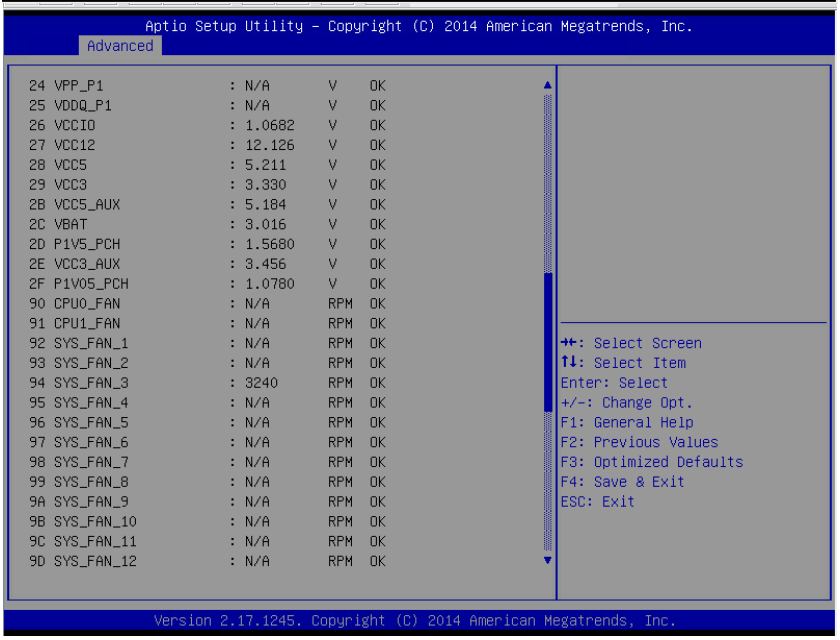
1. Fan Sensor: It is located in the third pin of the fan connector, which detects the fan speed (rpm)
2. Temp Sensor: PCH_Area_Temp, CPU1_MOS_Temp (RT31) and CPU0_MOS_Temp(RT33). They detect the system temperature around.

NOTE: The system temperature is measured in a scale defined by **Intel**, not in Fahrenheit or Celsius.

BIOS Temp Sensor Name Explanation:




Aptio Setup Utility – Copyright (C) 2014 American Megatrends, Inc.
Advanced
5A CPU1_DIMM_C1 : N/A °C OK
5D CPU1_DIMM_D0 : N/A °C OK
5E CPU1_DIMM_D1 : N/A °C OK
20 VCCP_P0 : 1.8228 V OK
21 VPP_P0 : 2.5345 V OK
22 VDDQ_P0 : 1.2348 V OK
23 VCCP_P1 : N/A V OK
24 VPP_P1 : N/A V OK
25 VDDQ_P1 : N/A V OK
26 VCCIO : 1.0682 V OK
27 VCC12 : 12.126 V OK
28 VCC5 : 5.211 V OK
29 VCC3 : 3.330 V OK
2B VCC5_AUX : 5.184 V OK
2C VBAT : 3.016 V OK
2D P1V5_PCH : 1.5680 V OK
2E VCC3_AUX : 3.456 V OK
2F P1V05_PCH : 1.0780 V OK
90 CPU0_FAN : N/A RPM OK
91 CPU1_FAN : N/A RPM OK
92 SYS_FAN_1 : N/A RPM OK
93 SYS_FAN_2 : N/A RPM OK
94 SYS_FAN_3 : 3240 RPM OK
95 SYS_FAN_4 : N/A RPM OK
96 SYS_FAN_5 : N/A RPM OK
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.17.1245. Copyright (C) 2014 American Megatrends, Inc.


Aptio Setup Utility – Copyright (C) 2014 American Megatrends, Inc.
Advanced
24 VPP_P1 : N/A V OK
25 VDDQ_P1 : N/A V OK
26 VCCIO : 1.0682 V OK
27 VCC12 : 12.126 V OK
28 VCC5 : 5.211 V OK
29 VCC3 : 3.330 V OK
2B VCC5_AUX : 5.184 V OK
2C VBAT : 3.016 V OK
2D P1V5_PCH : 1.5680 V OK
2E VCC3_AUX : 3.456 V OK
2F P1V05_PCH : 1.0780 V OK
90 CPU0_FAN : N/A RPM OK
91 CPU1_FAN : N/A RPM OK
92 SYS_FAN_1 : N/A RPM OK
93 SYS_FAN_2 : N/A RPM OK
94 SYS_FAN_3 : 3240 RPM OK
95 SYS_FAN_4 : N/A RPM OK
96 SYS_FAN_5 : N/A RPM OK
97 SYS_FAN_6 : N/A RPM OK
98 SYS_FAN_7 : N/A RPM OK
99 SYS_FAN_8 : N/A RPM OK
9A SYS_FAN_9 : N/A RPM OK
9B SYS_FAN_10 : N/A RPM OK
9C SYS_FAN_11 : N/A RPM OK
9D SYS_FAN_12 : N/A RPM OK
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
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BIOS Temp Sensor	Name Explanation
CPU0_DTS_Temp	Temperature of the CPU0 Digital Temperature Sensor
CPU1_DTS_Temp	Temperature of the CPU1 Digital Temperature Sensor
CPU0_PECI_Temp	Temperature of the CPU0 Platform Environment Control Interface
CPU1_PECI_Temp	Temperature of the CPU1 Platform Environment Control Interface
CPU0_MOS_Temp	Temperature of the CPU0_MOS_ Area
CPU1_MOS_Temp	Temperature of the CPU1_MOS_ Area
PCH_Area_Temp	Temperature of the PCH Area
System Air_Inlet	Temperature of the System_Air_Inlet Area
CPU0_DIMM_A0	Temperature of CPU0 DIMM A0 Slot
CPU0_DIMM_A1	Temperature of CPU0 DIMM A1 Slot
CPU0_DIMM_B0	Temperature of CPU0 DIMM B0 Slot
CPU0_DIMM_B1	Temperature of CPU0 DIMM B1 Slot
CPU0_DIMM_C0	Temperature of CPU0 DIMM C0 Slot
CPU0_DIMM_C1	Temperature of CPU0 DIMM C1 Slot
CPU0_DIMM_D0	Temperature of CPU0 DIMM D0 Slot
CPU0_DIMM_D1	Temperature of CPU0 DIMM D1 Slot
CPU1_DIMM_A0	Temperature of CPU1 DIMM A0 Slot
CPU1_DIMM_A1	Temperature of CPU1 DIMM A1 Slot
CPU1_DIMM_B0	Temperature of CPU1 DIMM B0 Slot
CPU1_DIMM_B1	Temperature of CPU1 DIMM B1 Slot
CPU1_DIMM_C0	Temperature of CPU1 DIMM C0 Slot
CPU1_DIMM_C1	Temperature of CPU1 DIMM C1 Slot
CPU1_DIMM_D0	Temperature of CPU1 DIMM D0 Slot
CPU1_DIMM_D1	Temperature of CPU1 DIMM D1 Slot

BIOS FAN Sensor	Name Explanation
CPU0_FAN	Fan speed of CPU0_FAN
CPU1_FAN	Fan speed of CPU1_FAN
SYS_FAN_1	Fan speed of SYS_FAN_1
SYS_FAN_2	Fan speed of SYS_FAN_2
SYS_FAN_3	Fan speed of SYS_FAN_3
SYS_FAN_4	Fan speed of SYS_FAN_4
SYS_FAN_5	Fan speed of SYS_FAN_5
SYS_FAN_6	Fan speed of SYS_FAN_6
SYS_FAN_7	Fan speed of SYS_FAN_7
SYS_FAN_8	Fan speed of SYS_FAN_8
SYS_FAN_9	Fan speed of SYS_FAN_9
SYS_FAN_10	Fan speed of SYS_FAN_10

SYS_FAN_11	Fan speed of SYS_FAN_11
SYS_FAN_12	Fan speed of SYS_FAN_12

NOTE

Glossary

ACPI (Advanced Configuration and Power Interface): a power management specification that allows the operating system to control the amount of power distributed to the computer's devices. Devices not in use can be turned off, reducing unnecessary power expenditure.

AGP (Accelerated Graphics Port): a PCI-based interface which was designed specifically for demands of 3D graphics applications. The 32-bit AGP channel directly links the graphics controller to the main memory. While the channel runs only at 66 MHz, it supports data transmission during both the rising and falling ends of the clock cycle, yielding an effective speed of 133 MHz.

ATAPI (AT Attachment Packet Interface): also known as IDE or ATA; a drive implementation that includes the disk controller on the device itself. It allows CD-ROMs and tape drives to be configured as master or slave devices, just like HDDs.

ATX: the form factor designed to replace the AT form factor. It improves on the AT design by rotating the board 90 degrees, so that the IDE connectors are closer to the drive bays, and the CPU is closer to the power supply and cooling fan. The keyboard, mouse, USB, serial, and parallel ports are built-in.

Bandwidth: refers to carrying capacity. The greater the bandwidth, the more data the bus, phone line, or other electrical path can carry. Greater bandwidth results in greater speed.

BBS (BIOS Boot Specification): a feature within the BIOS that creates, prioritizes, and maintains a list of all Initial Program Load (IPL) devices, and then stores that list in NVRAM. IPL devices have the ability to load and execute an OS, as well as provide the ability to return to the BIOS if the OS load process fails. At that point, the next IPL device is called upon to attempt loading of the OS.

BIOS (Basic Input/Output System): the program that resides in the ROM chip, which provides the basic instructions for controlling your computer's hardware. Both the operating system and application software use BIOS routines to ensure compatibility.

Buffer: a portion of RAM which is used to temporarily store data; usually from an application though it is also used when printing and in most keyboard drivers. The CPU can manipulate data in a buffer before copying it to a disk drive. While this improves system performance (reading to or writing from a disk drive a single time is much faster than doing so repeatedly) there is the possibility of losing your data should the system crash. Information in a buffer is temporarily stored, not permanently saved.

Bus: a data pathway. The term is used especially to refer to the connection between the processor and system memory, and between the processor and PCI or ISA local buses.

Bus mastering: allows peripheral devices and IDEs to access the system memory without going through the CPU (similar to DMA channels).

Cache: a temporary storage area for data that will be needed often by an application. Using a cache lowers data access times since the information is stored in SRAM instead of slower DRAM. Note that the cache is also much smaller than your regular memory: a typical cache size is 512KB, while you may have as much as 4GB of regular memory.

Closed and open jumpers: jumpers and jumper pins are active when they are “on” or “closed”, and inactive when they are “off” or “open”.

CMOS (Complementary Metal-Oxide Semiconductors): chips that hold the basic startup information for the BIOS.

COM port: another name for the serial port, which is called as such because it transmits the eight bits of a byte of data along one wire, and receives data on another single wire (that is, the data is transmitted in serial form, one bit after another). Parallel ports transmit the bits of a byte on eight different wires at the same time (that is, in parallel form, eight bits at the same time).

DDR (Double Data Rate): a technology designed to double the clock speed of the memory. It activates output on both the rising and falling edge of the system clock rather than on just the rising edge, potentially doubling output.

DIMM (Dual In-line Memory Module): faster and more capacious form of RAM than SIMMs, and do not need to be installed in pairs.

DIMM bank: sometimes called DIMM socket because the physical slot and the logical unit are the same. That is, one DIMM module fits into one DIMM socket, which is capable of acting as a memory bank.

DMA (Direct Memory Access): channels that are similar to IRQs. DMA channels allow hardware devices (like soundcards or keyboards) to access the main memory without involving the CPU. This frees up CPU resources for other tasks. As with IRQs, it is vital that you do not double up devices on a single line. Plug-n-Play devices will take care of this for you.

DRAM (Dynamic RAM): widely available, very affordable form of RAM which looses data if it is not recharged regularly (every few milliseconds). This refresh requirement makes DRAM three to ten times slower than non-recharged RAM such as SRAM.

ECC (Error Correction Code or Error Checking and Correcting): allows data to be checked for errors during run-time. Errors can subsequently be corrected at the same time that they're found.

EEPROM (Electrically Erasable Programmable ROM): also called Flash BIOS, it is a ROM chip which can, unlike normal ROM, be updated. This allows you to keep up with changes in the BIOS programs without having to buy a new chip. TYAN®'s BIOS updates can be found at http://**www.tyan.com**

ESCD (Extended System Configuration Data): a format for storing information about Plug-n-Play devices in the system BIOS. This information helps properly configure the system each time it boots.

Firmware: low-level software that controls the system hardware.

Form factor: an industry term for the size, shape, power supply type, and external connector type of the Personal Computer Board (PCB) or motherboard. The standard form factors are the AT and ATX.

Global timer: onboard hardware timer, such as the Real-Time Clock (RTC).

HDD: stands for Hard Disk Drive, a type of fixed drive.

H-SYNC: controls the horizontal synchronization/properties of the monitor.

HyperTransport™: a high speed, low latency, scalable point-to-point link for interconnecting ICs on boards. It can be significantly faster than a PCI bus for an equivalent number of pins. It provides the bandwidth and flexibility critical for today's networking and computing platforms while retaining the fundamental programming model of PCI.

IC (Integrated Circuit): the formal name for the computer chip.

IDE (Integrated Device/Drive Electronics): a simple, self-contained HDD interface. It can handle drives up to 8.4 GB in size. Almost all IDEs sold now are in fact Enhanced IDEs (EIDEs), with maximum capacity determined by the hardware controller.

IDE INT (IDE Interrupt): Hardware interrupt signal that goes to the IDE.

I/O (Input/Output): the connection between your computer and another piece of hardware (mouse, keyboard, etc.)

IRQ (Interrupt Request): an electronic request that runs from a hardware device to the CPU. The interrupt controller assigns priorities to incoming requests and delivers them to the CPU. It is important that there is only one device hooked up to each IRQ line; doubling up devices on IRQ lines can lock up your system. Plug-n-Play operating systems can take care of these details for you.

Latency: the amount of time that one part of a system spends waiting for another part to catch up. This occurs most commonly when the system sends data out to a peripheral device and has to wait for the peripheral to spread (peripherals tend to be slower than onboard system components).

NVRAM: ROM and EEPROM are both examples of Non-Volatile RAM, memory that holds its data without power. DRAM, in contrast, is volatile.

Parallel port: transmits the bits of a byte on eight different wires at the same time.

PCI (Peripheral Component Interconnect): a 32 or 64-bit local bus (data pathway) which is faster than the ISA bus. Local buses are those which operate within a single system (as opposed to a network bus, which connects multiple systems).

PCI PIO (PCI Programmable Input/Output) modes: the data transfer modes used by IDE drives. These modes use the CPU for data transfer (in contrast, DMA channels do not). PCI refers to the type of bus used by these modes to communicate with the CPU.

PCI-to-PCI Bridge: allows you to connect multiple PCI devices onto one PCI slot.

Pipeline burst SRAM: a fast secondary cache. It is used as a secondary cache because SRAM is slower than SDRAM, but usually larger. Data is cached first to the faster primary cache, and then, when the primary cache is full, to the slower secondary cache.

PnP (Plug-n-Play): a design standard that has become ascendant in the industry. Plug-n-Play devices require little set-up to use. Devices and operating systems that are not Plug-n-Play require you to reconfigure your system each time you add or change any part of your hardware.

PXE (Preboot Execution Environment): one of four components that together make up the Wired for Management 2.0 baseline specification. PXE was
designed to define a standard set of preboot protocol services within a client with the goal of allowing networked-based booting to boot using industry standard protocols.

RAID (Redundant Array of Independent Disks): a way for the same data to be stored in different places on many hard drives. By using this method, the data is stored redundantly and multiple hard drives will appear as a single drive to the operating system. RAID level 0 is known as striping, where data is striped (or overlapped) across multiple hard drives, but offers no fault-tolerance. RAID level 1 is known as mirroring, which stores the data within at least two hard drives, but does not stripe. RAID level 1 also allows for faster access time and fault-tolerance, since either hard drive can be read at the same time. RAID level 0+1 is striping and mirroring, providing fault-tolerance, striping, and faster access all at the same time.

RAIDIOS: RAID I/O Steering (Intel)

RAM (Random Access Memory): technically refers to a type of memory where any byte can be accessed without touching the adjacent data and is often referred to the system's main memory. This memory is available to any program running on the computer.

ROM (Read-Only Memory): a storage chip which contains the BIOS; the basic instructions required to boot the computer and start up the operating system.

SDRAM (Synchronous Dynamic RAM): called as such because it can keep two sets of memory addresses open simultaneously. By transferring data alternately from one set of addresses and then the other, SDRAM cuts down on the delays associated with non-synchronous RAM, which must close one address bank before opening the next.

Serial port: called as such because it transmits the eight bits of a byte of data along one wire, and receives data on another single wire (that is, the data is transmitted in serial form, one bit after another).

SCSI Interrupt Steering Logic (SISL): Architecture that allows a RAID controller, such as AcceleRAID 150, 200 or 250, to implement RAID on a system board-embedded SCSI bus or a set of SCSI busses. SISL: SCSI Interrupt Steering Logic (LSI) (only on LSI SCSI boards)

Sleep/Suspend mode: in this mode, all devices except the CPU shut down.

SDRAM (Static RAM): unlike DRAM, this type of RAM does not need to be refreshed in order to prevent data loss. Thus, it is faster and more expensive.

SLI (Scalable Link Interface): NVIDIA SLI technology links two graphics cards together to provide scalability and increased performance. NVIDIA SLI takes advantage of the increased bandwidth of the PCI Express bus architecture, and features hardware and software innovations within NVIDIA GPUs (graphics processing units) and NVIDIA MCPs (media and communications processors). Depending on the application, NVIDIA SLI can deliver as much as two times the performance of a single GPU configuration.

Standby mode: in this mode, the video and hard drives shut down; all other devices continue to operate normally.

UltraDMA-33/66/100: a fast version of the old DMA channel. UltraDMA is also called UltraATA. Without a proper UltraDMA controller, your system cannot take advantage of higher data transfer rates of the new UltraDMA/UltraATA hard drives.

USB (Universal Serial Bus): a versatile port. This one port type can function as a serial, parallel, mouse, keyboard or joystick port. It is fast enough to support video transfer, and is capable of supporting up to 127 daisy-chained peripheral devices.

VGA (Video Graphics Array): the PC video display standard

V-SYNC: controls the vertical scanning properties of the monitor.

ZCR (Zero Channel RAID): PCI card that allows a RAID card to use the onboard SCSI chip, thus lowering cost of RAID solution

ZIF Socket (Zero Insertion Force socket): these sockets make it possible to insert CPUs without damaging the sensitive CPU pins. The CPU is lightly placed in an open ZIF socket, and a lever is pulled down. This shifts the processor over and down, guiding it into the board and locking it into place.

Technical Support

If a problem arises with your system, you should first turn to your dealer for direct support. Your system has most likely been configured or designed by them and they should have the best idea of what hardware and software your system contains. Hence, they should be of the most assistance for you. Furthermore, if you purchased your system from a dealer near you, take the system to them directly to have it serviced instead of attempting to do so yourself (which can have expensive consequences).

If these options are not available for you then TYAN® Computer Corporation can help. Besides designing innovative and quality products for over a decade, TYAN has continuously offered customers service beyond their expectations. TYAN®'s website (**www.tyan.com**) provides easy-to-access FAQ searches and online Trouble Ticket creation as well as Instant Chat capabilities with our Support Agents. TYAN® also provides easy-to-access resources such as in-depth Linux Online Support sections with downloadable Linux drivers and comprehensive compatibility reports for chassis, memory and much more. With all these convenient resources just a few keystrokes away, users can easily find the latest software and operating system components to keep their systems running as powerful and productive as possible. TYAN® also ranks high for its commitment to fast and friendly customer support through email. By offering plenty of options for users, TYAN® serves multiple market segments with the industry's most competitive services to support them.

"TYAN's tech support is some of the most impressive we've seen, with great response time and exceptional organization in general" - Anandtech.com

Help Resources:

1. See the beep codes section of this manual.
2. See the TYAN® website for FAQ's, bulletins, driver updates, and other information: **http://www.tyan.com**
3. Contact your dealer for help BEFORE calling TYAN®.
4. Check the TYAN® user group in Google Forum: **alt.comp.periphs.mainboard.TYAN**

Returning Merchandise for Service

During the warranty period, contact your distributor or system vendor FIRST for any product problems. This warranty only covers normal customer use and does not cover damages incurred during shipping or failure due to the alteration, misuse, abuse, or improper maintenance of products.

NOTE:
A receipt or copy of your invoice marked with the date of purchase is required before any warranty service can be rendered. You may obtain service by calling the manufacturer for a Return Merchandise Authorization (RMA) number. The RMA number Should be prominently displayed on the outside of the shipping carton and the package should be mailed prepaid. TYAN® will pay to have the board shipped back to you.

Notice for the USA
Compliance Information Statement (Declaration of Conformity Procedure) DoC
FCC Part 15: This device complies with part 15 of the FCC Rules

Operation is subject to the following conditions:

This device may not cause harmful interference, and this device must accept any interference received including interference that may cause undesired operation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try one or more of the following measures:
Reorient or relocate the receiving antenna.
Increase the separation between the equipment and the receiver.
Plug the equipment into an outlet on a circuit different from that of the receiver.
Consult the dealer on an experienced radio/television technician for help.

Notice for Canada
This apparatus complies with the Class B limits for radio interference as specified in the Canadian Department of Communications Radio Interference Regulations. (Cet appareil est conforme aux norms de Classe B d'interference radio tel que specifie par le Ministere Canadien des Communications dans les reglements d'ineteference radio.)

CAUTION: Lithium battery included with this board. Do not puncture, mutilate, or dispose of battery in fire. There is danger of an explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by manufacturer. Dispose of used battery according to manufacturer instructions and in accordance with your local regulations.

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