ADLINK TECHNOLOGY INC.

CSA-5100

1U Rackmount Network Appliance with Intel® Xeon® Processor E3-1200 v3 Family

User's Manual



Manual Revision: 1.01
Revision Date: November 25, 2014
Part No.: 50-1Z176-1000

Advance Technologies; Automate the World.

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Revision History

Revision	Release Date	Description of Change(s)
1.00	18/08/2014	Initial release
1.01	25/11/2014	Remove CSA-5200; add French safety chapter; update fans, CPU heatsink

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Table of Contents

Revision History **2**
1 Overview **5**
1.1 Introduction 5
1.2 Block Diagram 6
1.3 Mechanical Overview 7
1.3.1 Front Panel 7
1.3.2 Rear Panel 7
1.3.3 Chassis Layout 8
1.4 Mechanical Dimensions 9
1.4.1 Dimensions 9
1.5 Package Contents 10
2 Specifications **11**
2.1 CSA-5100 Specifications 11
2.2 Software Support 12
2.3 Network Mezzanine Card Support 12
2.4 Optional Accessories 12
3 Getting Started **13**
3.1 Removing the Chassis Lid 13
3.2 Installing the CPU/Heatsink 13
3.3 Installing a 2.5" SATA Drive 16
3.4 Installing a Network Interface Module 19
3.5 Driver Installation 21
4 System Interfaces **22**
4.1 Front Panel I/O 22
4.1.1 Status LEDs 22
4.1.2 LAN Connector (RJ-45) 22
4.1.3 Service Port Status LEDs 23
4.1.4 USB 3.0 Connectors 23
4.1.5 Remote Console Connector (RJ-45) 23
4.2 Board Layout 24
4.3 Connectors and Jumpers 25
4.3.1 PCIe x4 Connector (PCIE1) 25
4.3.2 CFast Connector (CN17) 26
4.3.3 VGA Header (CNX1) 26
4.3.4 ATX12V Connector (CN24) 27
4.3.5 Fan Connectors (FAN1/FAN6-9) 27
4.3.6 ATX Connector (CN19) 27
4.3.7 mSATA Connectors (CN9/CN48) 28
4.3.8 SATA Connectors (CN30-33) 28
4.3.9 SATADOM Power Connector (CN18, Wafer 1.25mm pitch) 29
4.3.10 Clear CMOS Jumper (JBAT1) 29
4.3.11 NIM Slot connectors (PCI1-4) 29
5 LAN Bypass Function **31**
5.1 Hardware Description 31
5.2 BIOS Settings 32
5.3 SuperIO Watchdog Driver & API 33
5.3.1 Overview 33

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6 Watchdog Timer Programming 35
6.1 Architecture Overview 35
6.2 Deliverables 36
6.2.1 open 36
6.2.2 write 36
6.2.3 ioctl 37
6.2.4 release 38
6.3 Sample Code 38
7 BIOS Setup 41
7.1 Entering BIOS Setup 41
7.2 Setup Menu 42
7.3 Navigation 42
7.4 Main Setup 45
7.4.1 System & Board Info 45
7.4.2 System Date/System Time 46
7.5 Advanced BIOS Setup 46
7.5.1 ACPI Settings 47
7.5.2 CPU Configuration 47
7.5.3 SATA Configuration 49
7.5.4 PCH-FW Configuration 50
7.5.5 USB Configuration 50
7.5.6 Super IO Configuration 51
7.5.7 IT8786 HW Monitor 52
7.5.8 Smart Fan Function 53
7.5.9 Serial Port Console Redirection 54
7.6 Chipset Setup 57
7.6.1 PCH-IO Configuration 57
7.6.2 System Agent (SA) Configuration 59
7.7 Boot Setup 62
7.8 Security Setup 63
7.9 Save & Exit Menu 64
Safety Instructions 67
Consignes de Sécurité Importantes 68
Getting Service 69

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1 Overview

1.1 Introduction

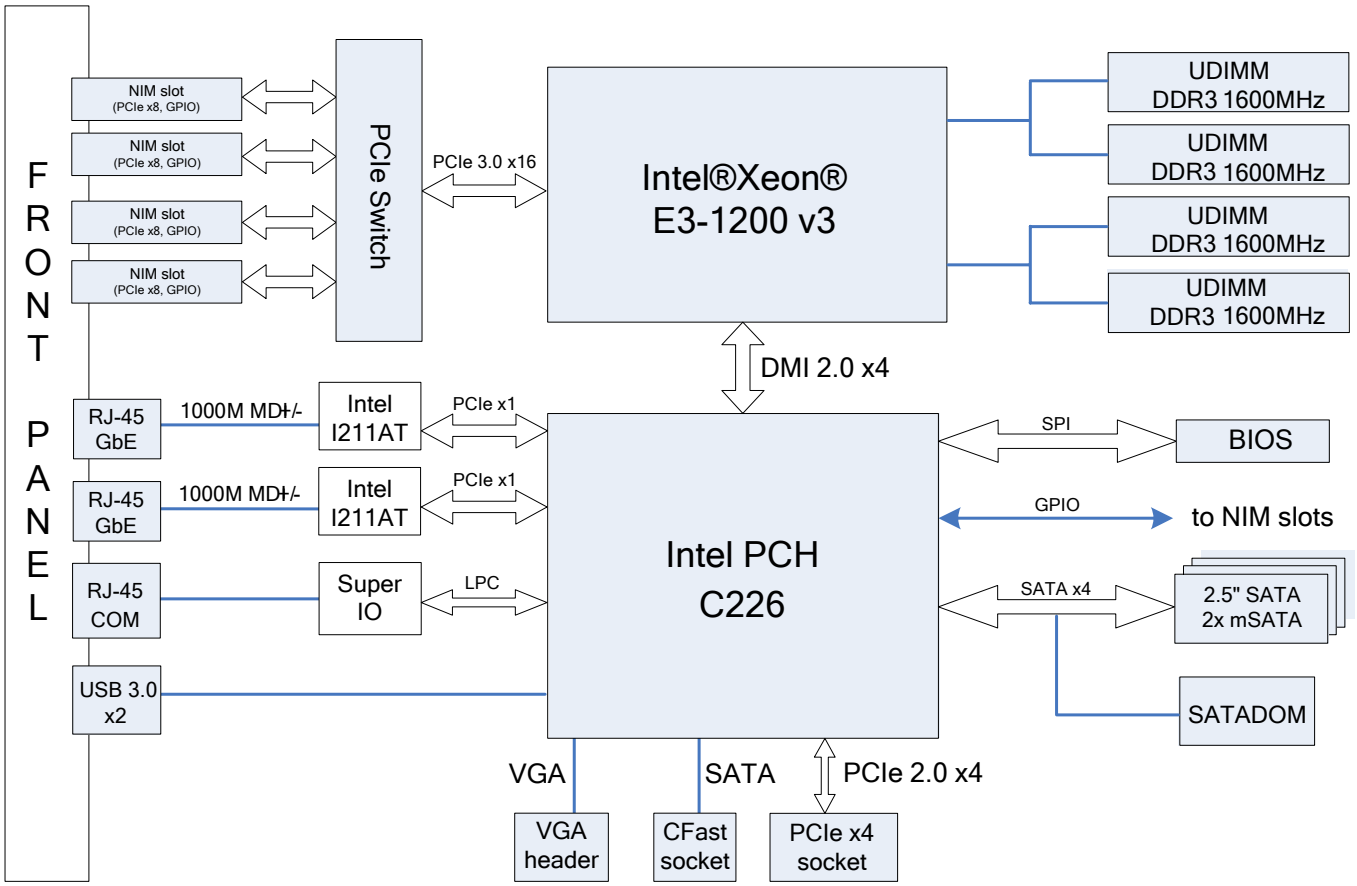
The ADLINK CSA-5100 is a 1U 19" rackmount Network Appliance with 4th Generation Intel® processor Xeon® E3-1200 v3 and Intel® C226 Chipset. The CSA-5100 features up to 32x GbE ports or 8x SFP+ with an I/O intensive architecture, high scalability with four Network Interface Module (NIM) slots, 2.5” SATA drive bay, 2 mSATA slots, additional storage interfaces (SATADOM, CFast), and is an ideal platform for communications infrastructure deployment.

Detailed features are outlined below and a functional block diagram is shown in the next section.

- 4th Gen Intel® processor Xeon® E3-1200 v3 with Intel® C226 Chipset
  - Intel® Xeon® E3-1275 v3 (4C/8T)
  - Intel® Xeon® E3-1225 v3 (4C/4T)
  - Intel® Core™ i3-4330 (2C/4T)
- 8MB/4M/3M/2M L2 cache, depending on CPU
- 4x DDR3-1066/1333/1600 240-pin DIMM sockets, non-ECC, up to 32 GB
- Up to 32x GbE ports or 8x SFP+ with I/O intensive architecture
- High scalability with four Network Interface Module (NIM) slots
- One 2.5” SATA drive bay, two mSATA slots
- Additional storage interfaces: SATADOM, CFast
- 1U 19” rackmount form factor for communications infrastructure deployment

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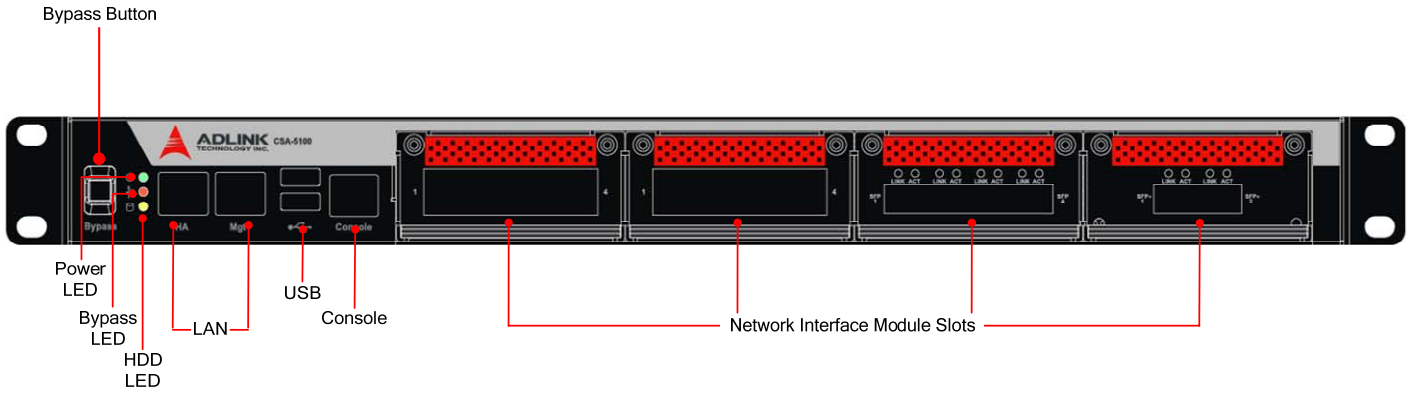
1.2 Block Diagram



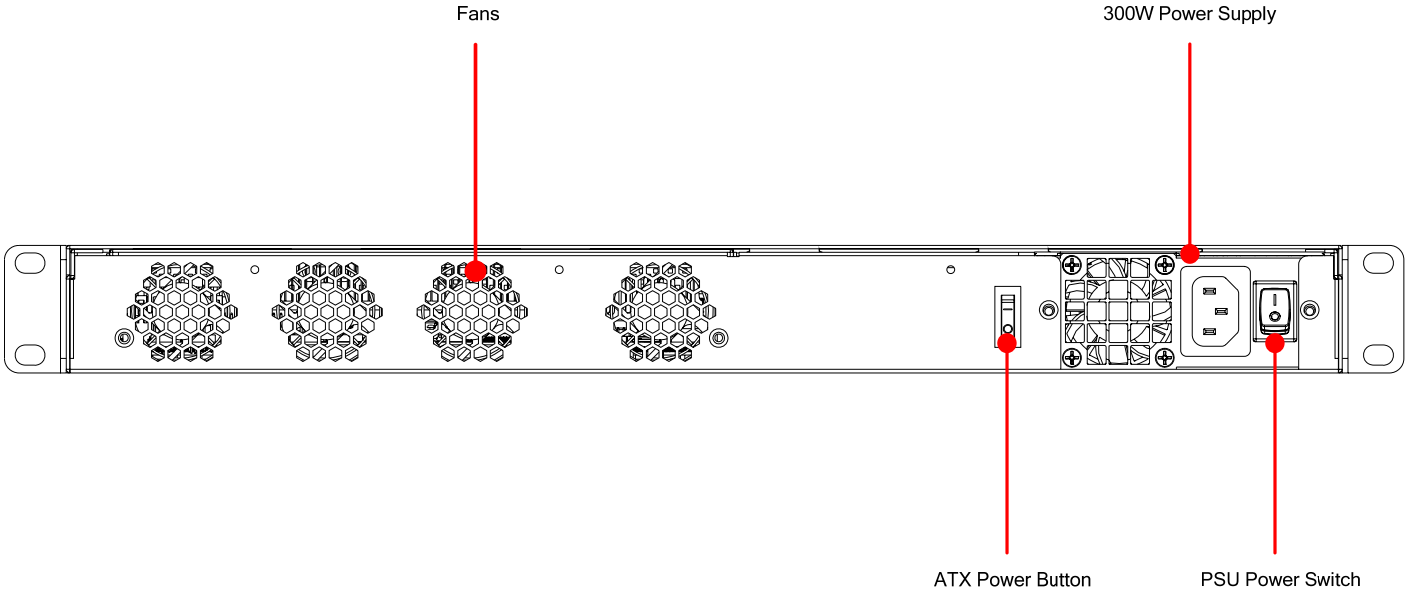
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1.3 Mechanical Overview

1.3.1 Front Panel

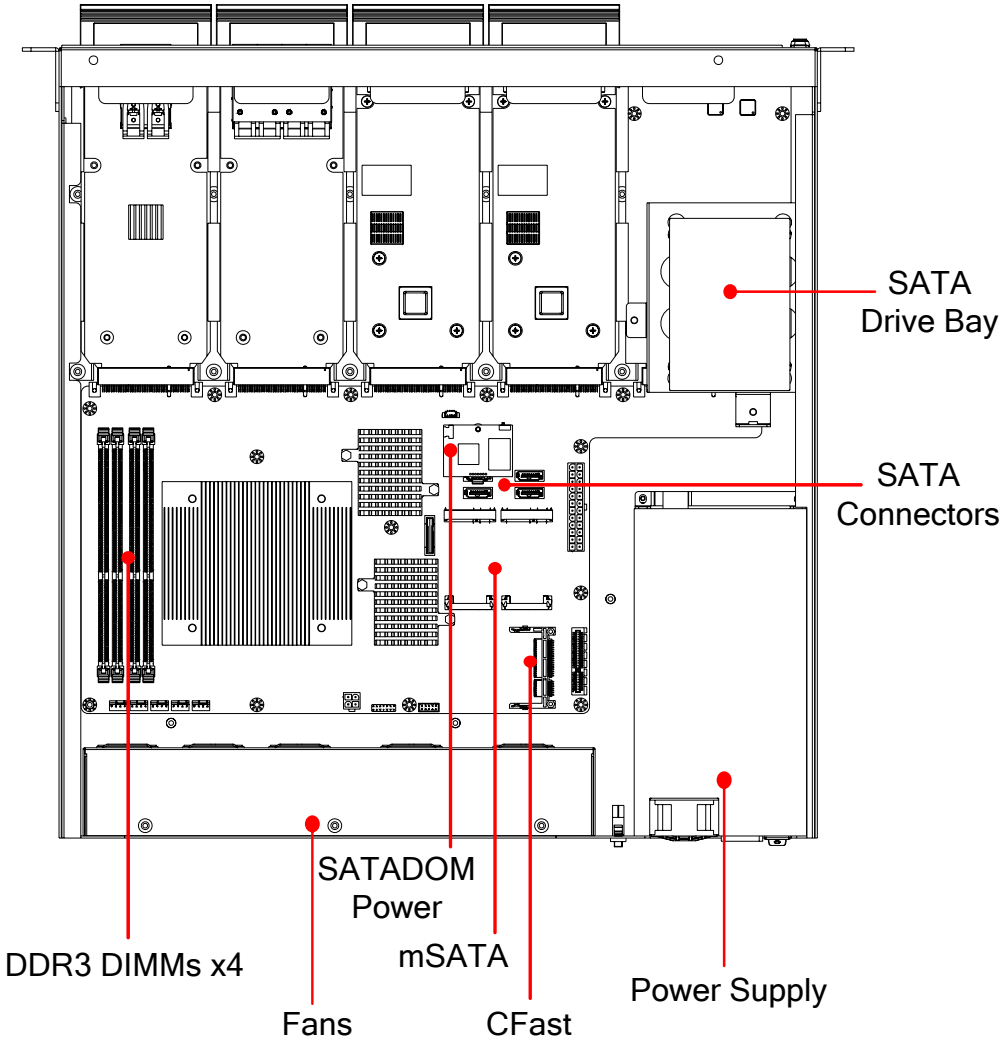


1.3.2 Rear Panel



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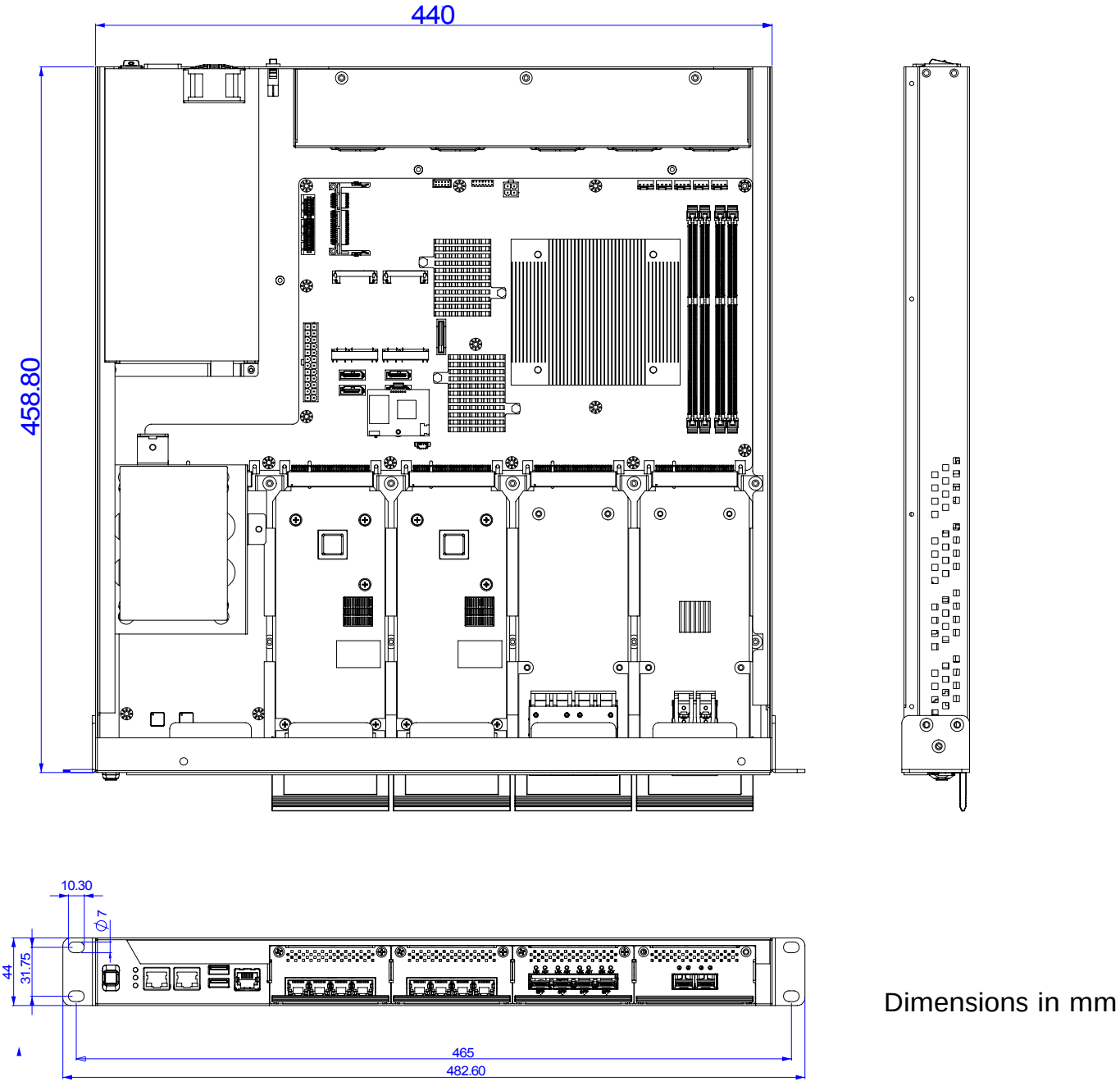
1.3.3 Chassis Layout



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1.4 Mechanical Dimensions

1.4.1 Dimensions



Dimensions in mm

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1.5 Package Contents

Before opening, please check the shipping carton for any damage. If the shipping carton and contents are damaged, notify the dealer for a replacement. Retain the shipping carton and packing material for inspection by the dealer. Obtain authorization before returning any product to ADLINK.

Check that the following items are included in the package. If there are any missing items, contact your dealer:

- CSA-5100 Rackmount Network Appliance
- VGA cable (pin header to DB-15)
- Remote console cable (RJ-45 to DB-9)
- Accessory pack (drive bracket mounting hardware)
- Power cord
- ADLINK All-In-One CD

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2 Specifications

2.1 CSA-5100 Specifications

Main System

CPU	Intel® Xeon® E3-1275 v3 (4C/8T) Intel® Xeon® E3-1225 v3 (4C/4T) Intel® Core™ i3-4330 (2C/4T)
L2 Cache	8MB/8MB/4MB
Chipset	Intel® C226 PCH
Memory	Four DDR3-1066/1333/1600 * 240-Pin Long-DIMM sockets, non-ECC, up to 32 GB
BIOS	AMI BIOS on SPI flash memory
Operating Systems	Windows 7 64bit, Linux kernel 2.6 and above (default: no OS installed)
Power Supply	1U: 300W AC

I/O Interfaces - Front

NIM Slots	4x Network Interface Module (NIM) slots
Ethernet	2x RJ-45 10/100/1000BASE-T Ethernet port
Remote Console	1x RJ-45 serial port
USB	2x USB 3.0

I/O Interfaces - Onboard

Security Acceleration	1x PCIe x4 Gen2 socket for acceleration card
Graphics	1x VGA header onboard

Storage

Drive Bays	1x 2.5” SATA drive bay, 2x mSATA
Other	1x SATADOM, 1x CFast socket

Buttons/LEDs

Power	1x ATX power button, rocker type (rear)
Bypass	1x bypass button (front)
LEDs	Power, Bypass Status, Drive Activity

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Mechanical & Environmental

Form Factor	19” 1U rackmount 440mm x 44mm x 440 mm (W x H x D)
Fans	4x fans speed adjustable Able to operate with 1 fan out of service
Power	300W, 100V-240VAC @ 60-50 Hz, full range, non-redundant power supply
Temperature	Operating temp.: 0°C -40°C Storage temp.: -40°C to 70°C Short term operating: -5°C to +45°C (5%-90% rel. humidity)
Humidity	Operating: 20% - 90% @40°C, non-condensing Storage: 5% - 90%, non-condensing
Shock	Operating: half-sine 2G, 11ms pulse, 100 pulses in each direction, on each of three axes
	Non-operating: trapezoidal, 25G, 170 inches/sec delta V, three drops in each direction, on each of three axes
Vibration	Non-operating: 2.2Grms, 10 minutes per axis on all three axes
Acoustic Level	Sound pressure < 75 dBA @1m with all fans at maximum speed
Certifications	FCC Class A, CE emissions, UL, CB and RoHS compliant
MTBF	50,000 hours

2.2 Software Support

ADLINK DPDK Toolkit	Enables Intel® DPDK
ADLINK DPI Toolkit	Intel® DPDK-based openDPI to boost DPI performance
ADLINK Load Balancing Toolkit	Intel® DPDK vSwitch-based Load Balancer

2.3 Network Mezzanine Card Support

CSA-Z4X01	4-port GbE copper with LAN bypass	PN: 91-37584-100E
CSA-Z5C4F	4-port GbE SFP without LAN bypass	PN: 91-37585-000E
CSA-Z8X10	8-port GbE copper with LAN bypass	PN: 91-37588-000E
CSA-Z5C2F	2-port SFP+ without LAN bypass	PN: 91-37589-000E

2.4 Optional Accessories

Riser Card	Riser card for PCIe x4 acceleration card	PN: 91-37591-000E

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3 Getting Started

3.1 Removing the Chassis Lid

1. Remove the four screws securing each side of the lid to the chassis.
2. Remove the three screws securing the rear of the lid to the chassis.
3. Slide the lid to the rear and remove from the chassis.

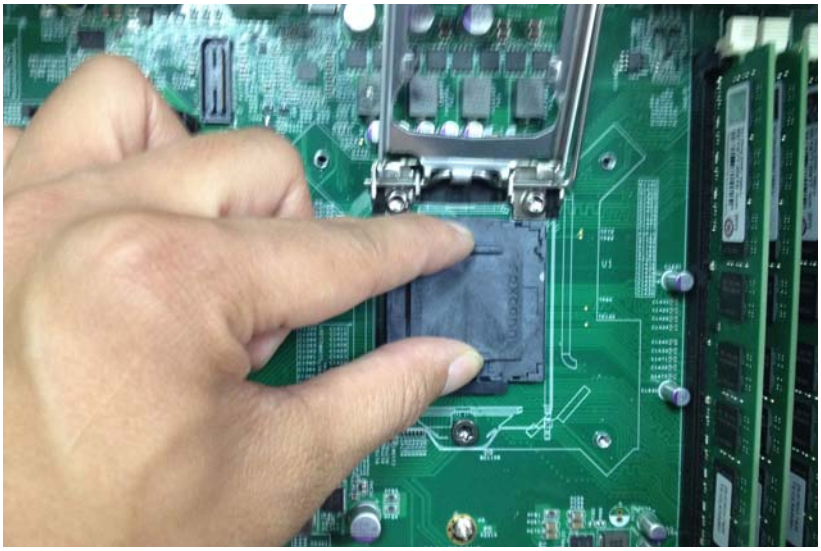
3.2 Installing the CPU/Heatsink

1. Locate the CPU sockets on the board.

2. Press the load lever, move it outwards until it is clear of the retention tab, then raise it



3. Open the load plate and remove the protective cover from the socket. Do not touch the socket contacts or the bottom of the processor.



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4. Carefully place the CPU into the socket, making sure the socket notches align with the processor notches and the alignment triangle on the CPU lines up with the correct corner on the socket,. Lower the processor straight down, without tilting or sliding the processor in the socket. Gently release the processor, making sure that it is seated correctly in the socket.

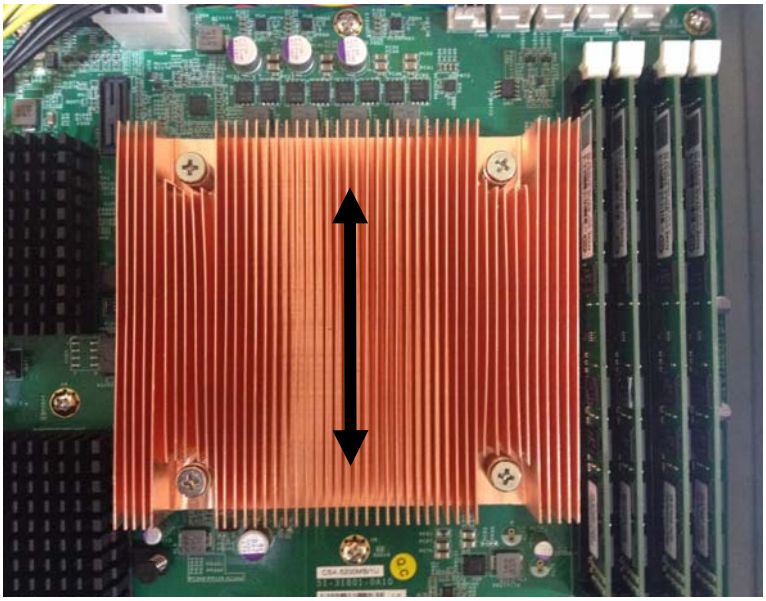


5. Close the load plate, push the load lever back down, and engage it with the retention tab.



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6. Make sure there is sufficient thermal paste on of the heatsink and place it on the CPU with the cooling fins aligned with the DIMM slots as shown.

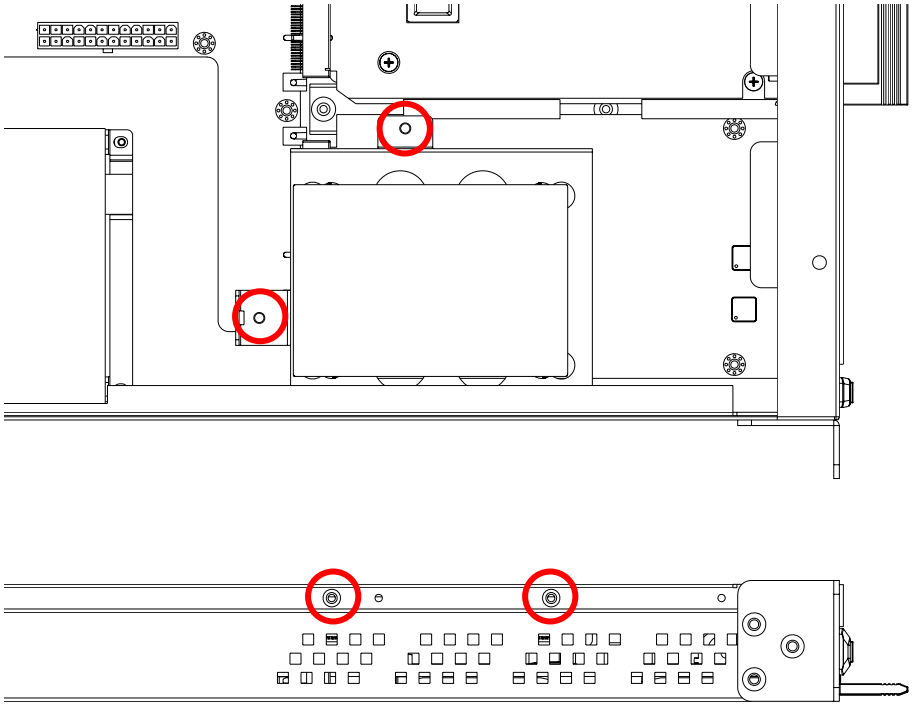


7. Tighten the captive screws in an "X" pattern until the heatsink is secured on the CPU. Do NOT over tighten the screws

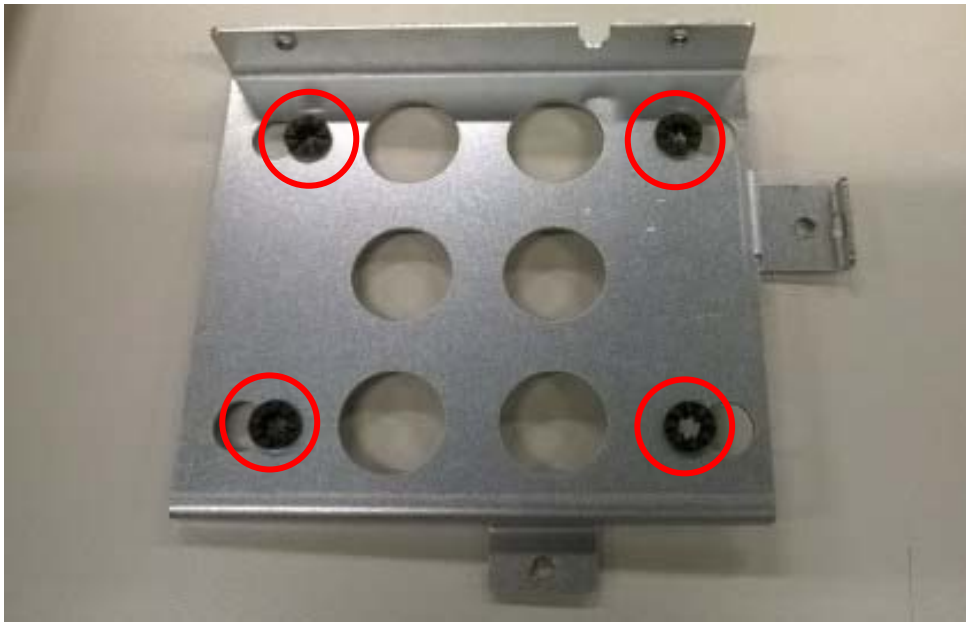
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3.3 Installing a 2.5" SATA Drive

1. Loosen the 4 screws securing the drive bracket to the chassis shown below and lift the bracket out.

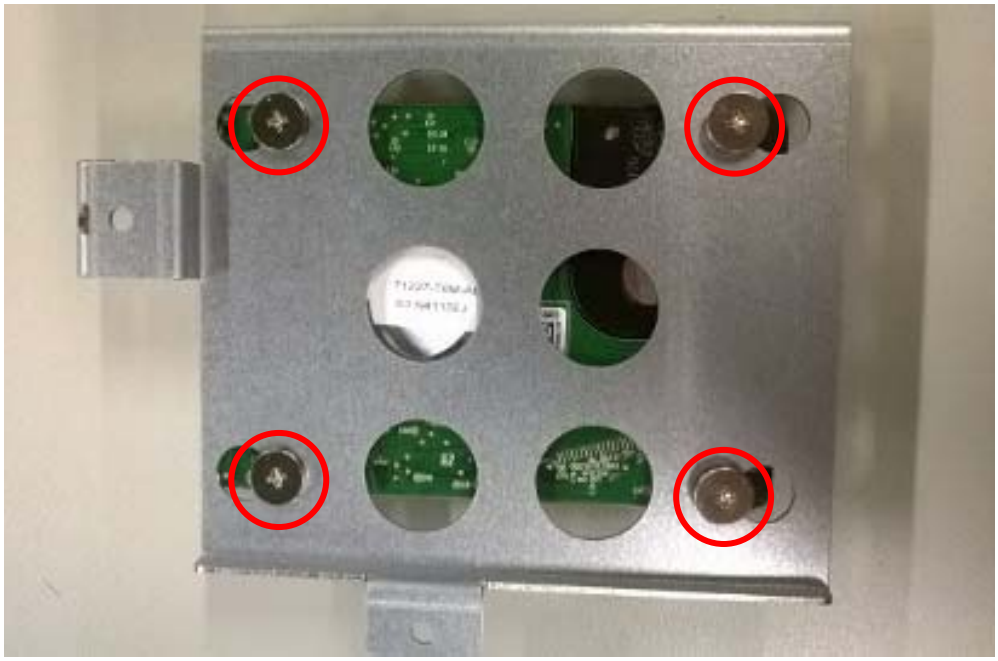


2. Insert the anti-shock grommets provided in the accessory pack as shown.



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3. Secure the 2.5" SATA drive to the bracket with four screws.



4. Install the drive/bracket assembly to the chassis, making sure to align the screw holes with the standoffs as shown. Secure the two screws.



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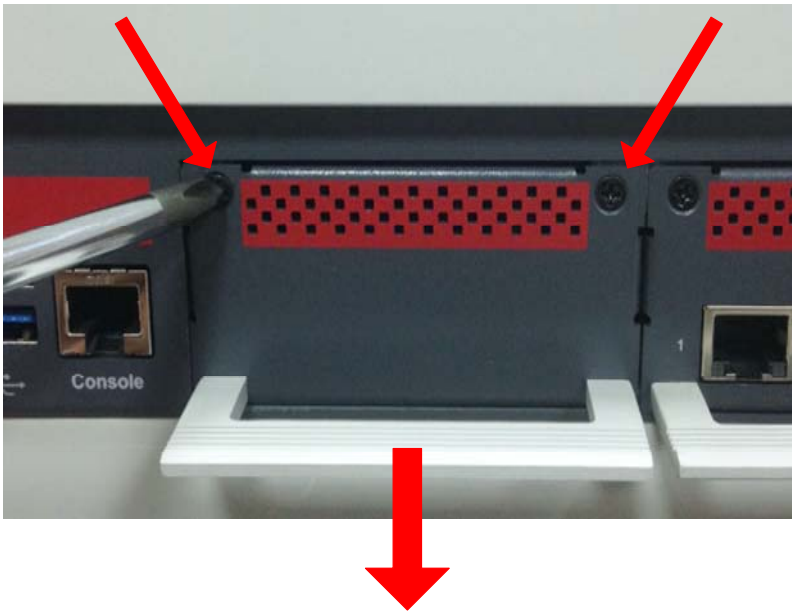
5. Secure the two screws on the side of the chassis as shown below.



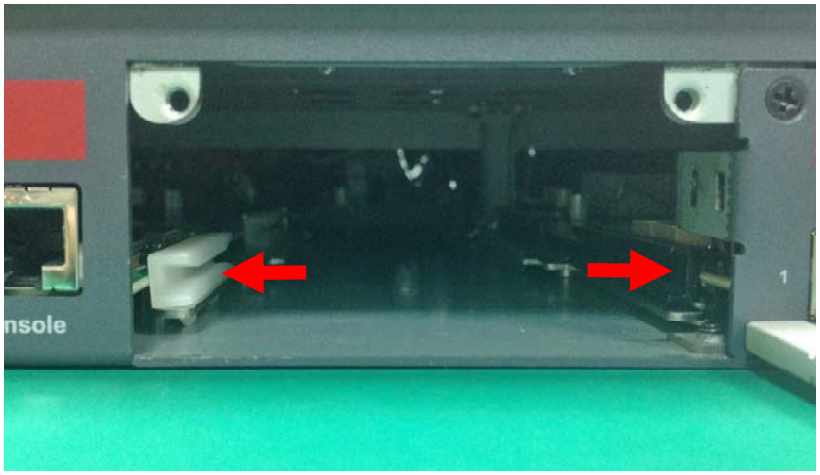
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3.4 Installing a Network Interface Module

1. Loosen the two screws on the Network Interface Module (NIM) faceplate, and pull outwards on the handle to remove the faceplate.

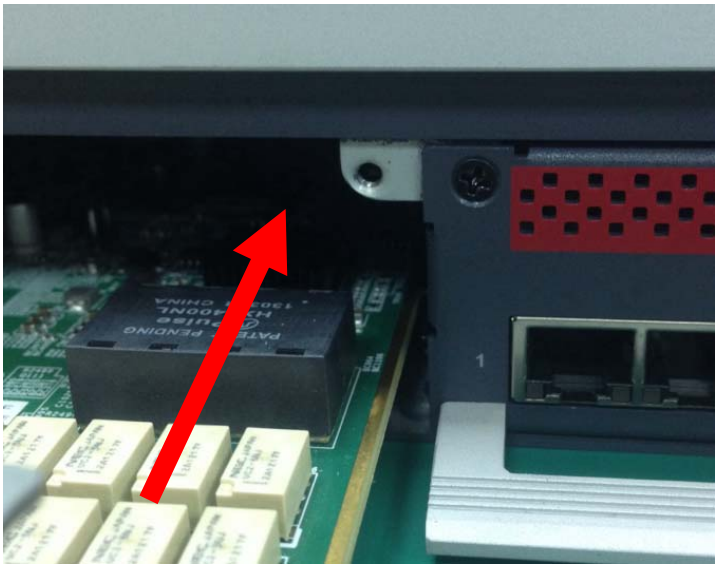


2. Align the NIM with the card guides in the slot as shown below.

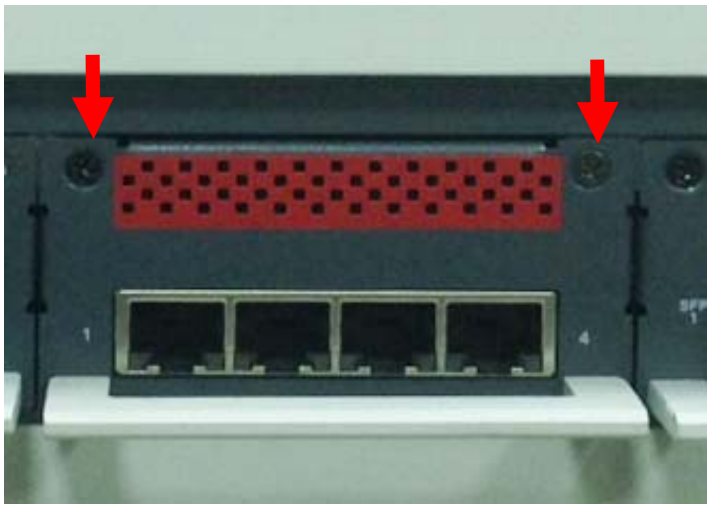


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3. Insert the NIM into the slot.



4. Secure the NIM with the two screws removed in Step 1.



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3.5 Driver Installation

The CSA-5100 drivers are available from the ADLINK All-In-One DVD at X:\CSA-5200\, or from the ADLINK website at: **http://www.adlinktech.com/PD/web/PD_detail.php?pid=1429**.

ADLINK provides validated drivers for Windows 7 64-bit. We recommend using these drivers to ensure compatibility.

The following describes the CSA-5100 driver installation procedures for Windows 7. Install the Windows operating system before installing any driver. Most standard I/O device drivers are installed during Windows installation.

1. Install the **chipset driver** by extracting and running the program in ... **\Driver_Infinst_autol\ infinst_autol.zip**

2. Install the **graphics driver** and utilities by extracting and running the program in ... **\Graphics_Driver_WIN7_64bit\ graphic_win64_10.18.10.3496.zip**.

3. Install the **LAN driver** by running the program in …**\LAN_Win7\PROWinx64.zip**.

4. Install the **Intel Management Engine and utilities** by extracting and running the program in …**\Intel_ME9.1_5M\ Intel_ME9.1_5M_9.1.0.1035.zip**.

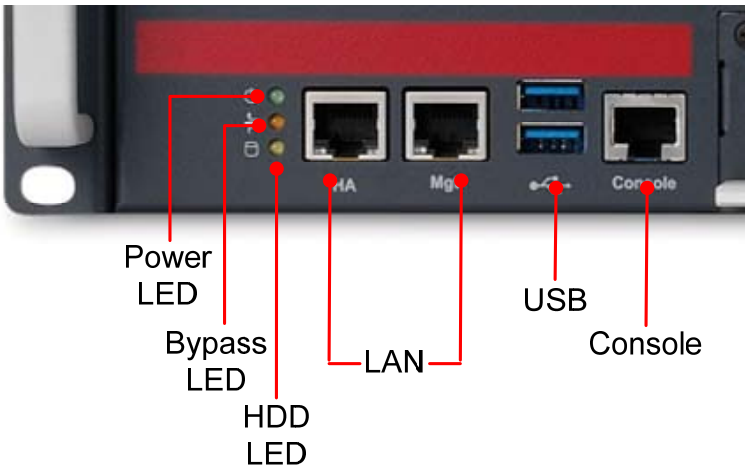
5. Install the **Intel Rapid Storage Technology utility** by extracting and running the program in …**\Intel Rapid Storage Technology\irst_12.5.0.1040.zip**.

6. Install the **USB 3.0 driver** by running the program in … **\USB_3.0_Win7\ USB_3.0_Win7_2.5.1.28.zip**.

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4 System Interfaces

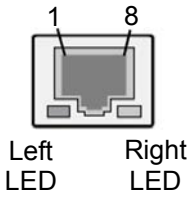
4.1 Front Panel I/O



4.1.1 Status LEDs

Power LED	Green: Power On
Bypass Status LED	Red: Bypass; Off: No Bypass
HDD Activity LED	Flashing Yellow: Read/Write; Off: No activity

4.1.2 LAN Connector (RJ-45)



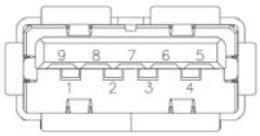
Pin	Signal
1	MID0+
2	MID0-
3	MID1+
4	MID2+
5	MID2-
6	MID1-
7	MID3+
8	MID3-

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4.1.3 Service Port Status LEDs

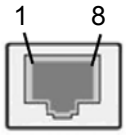
LAN	LED	Status	LED Color
GbE	Left	10 Mbps	Off
		100 Mbps	GREEN
	Right Right	1000 Mbps	Yellow
		LINK with no activity	Green
SFP/SFP+	Left	LINK up	Yellow
		Link down	Off
	Right	LINK down or Link with no activity	Off
		LINK with activity	Green Blinking

4.1.4 USB 3.0 Connectors



Pin	Signal
1	P5V_USB3
2	S_USB2_N0_R
3	S_USB2_P0_R
4	GND
5	S_USB3_RN1_R
6	S_USB3_RP1_R
7	GND
8	S_USB3_TN1_R
9	S_USB3_TP1_R

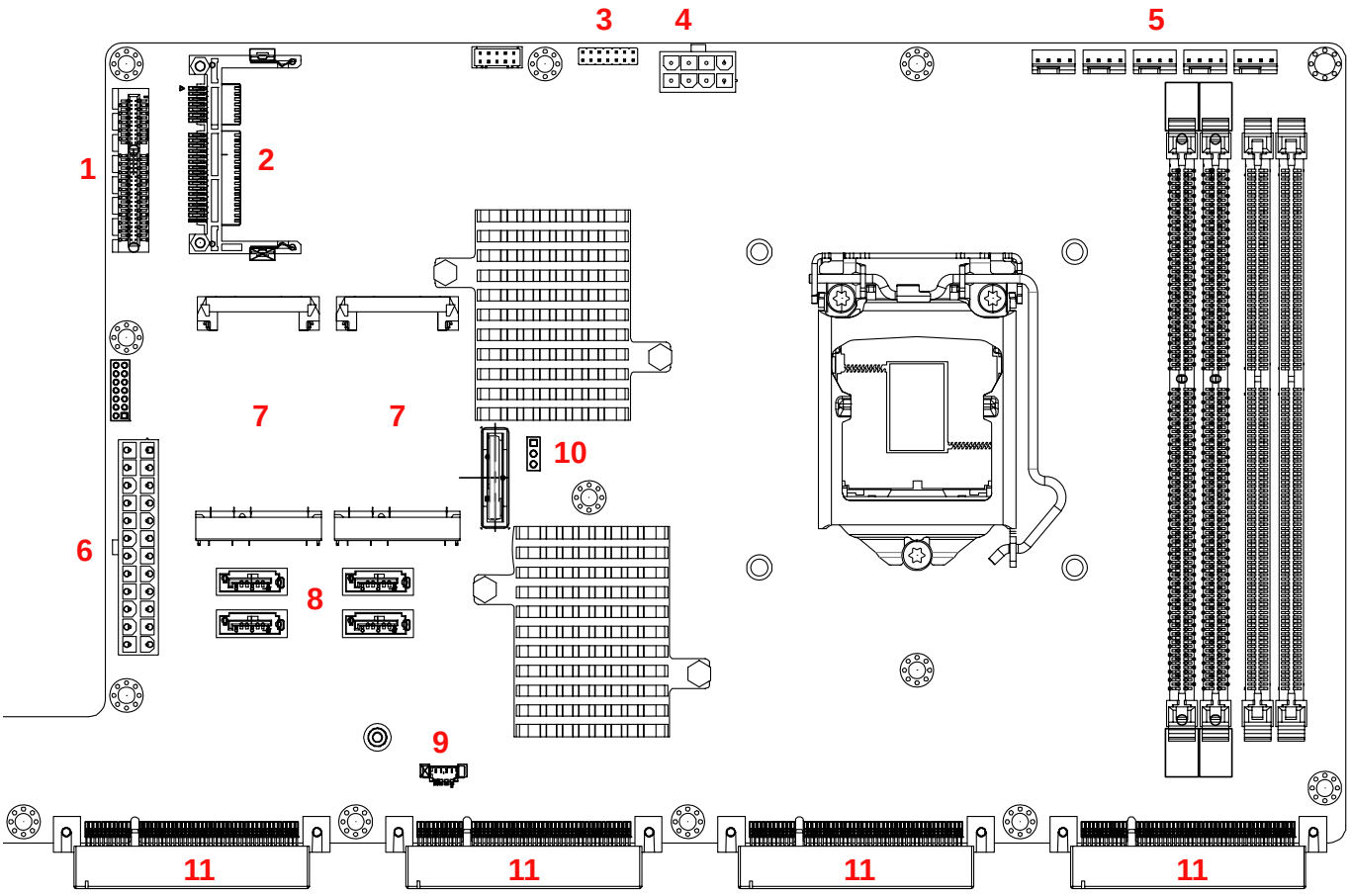
4.1.5 Remote Console Connector (RJ-45)



Pin	Signal
1	DCD-L_CN
2	RTS-L_CN
3	DSR-L_CN
4	TXD_CN
5	RXD_CN
6	GND
7	CTS-L_CN
8	DTR-L_CN

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4.2 Board Layout



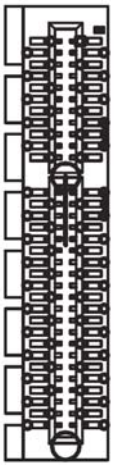
Location	Description	Location	Description
1	PCIe x4 connector (PCIE1)	**7**	mSATA connectors (CN9/CN48)
2	CFast connector (CN17)	**8**	SATA connectors (CN30-33)
3	VGA header (CNX1)	**9**	SATADOM power connector (CN18)
4	ATX12V connector (CN24)	**10**	Clear CMOS jumper (JBAT1)
5	Fan connectors (FAN1/FAN6-9)	**11**	NIM slot connectors (PCI1-4)
6	ATX connector (CN19)		

NOTE: SATA connector CN32 is shared with SATADOM.

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4.3 Connectors and Jumpers

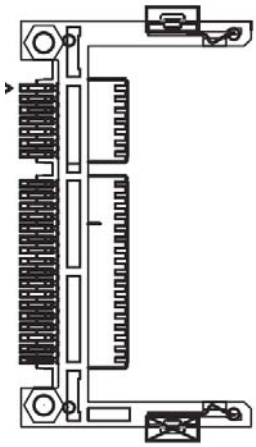
4.3.1 PCIe x4 Connector (PCIE1)



Pin	Signal	Pin	Signal
A1	PRSNT1#	B1	+12V
A2	+12V	B2	+12V
A3	+12V	B3	+12V
A4	GND	B4	GND
A5	JTAG2	B5	SMCLK
A6	JTAG3	B6	SMDAT
A7	JTAG4	B7	GND
A8	JTAG5	B8	+3.3V
A9	+3.3V	B9	JTAG1
A10	+3.3V	B10	3.3Vaux
A11	PERST#	B11	WAKE#
A12	GND	B12	RSVD
A13	REFCLK+	B13	GND
A14	REFCLK-	B14	PETp0
A15	GND	B15	PETn0
A16	PERp0	B16	GND
A17	PERn0	B17	PRSNT2#
A18	GND	B18	GND
A19	RSVD	B19	PETp1
A20	GND	B20	PETn1
A21	PERp1	B21	GND
A22	PERn1	B22	GND
A23	GND	B23	PETp2
A24	GND	B24	PETn2
A25	PERp2	B25	GND
A26	PERn2	B26	GND
A27	GND	B27	PETp3
A28	GND	B28	PETn3
A29	PERp3	B29	GND
A30	PERn3	B30	RSVD
A31	GND	B31	PRSNT2#
A32	RSVD	B32	GND

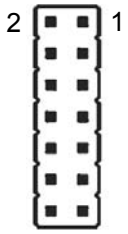
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4.3.2 CFast Connector (CN17)



Pin	Signal
S1	GND
S2	CF_TX_DP
S3	CF_TX_DN
S4	GND
S5	CF_RX_DN
S6	CF_RX_DP
S7	GND
P1	CFast_CDI
P2	GND
P3	NC
P4	NC
P5	NC
P6	NC
P7	NC
P8	GND
P9	NC
P10	NC
P11	NC
P12	NC
P13	P3V3
P14	P3V3
P15	GND
P16	GND
P17	CFast_CDO

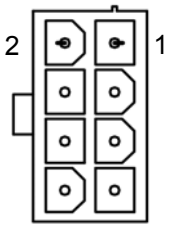
4.3.3 VGA Header (CNX1)



Pin	Signal
1	S_DDC_DATA_R
2	S_DDC_CLK_R
3	S_VGA_RED_CONN
4	S_VGA_GREEN_CONN
5	S_VGA_BLUE_CONN
6	S_VGA_HSYNC
7	S_VGA_VSYNC
8	VGA_VCC
9	NC
10-14	GND

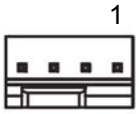
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4.3.4 ATX12V Connector (CN24)



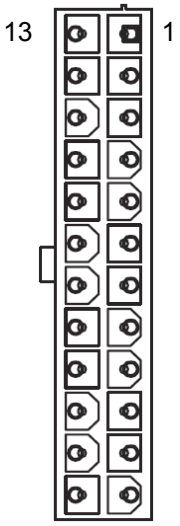
Pin	Signal
1-4	GND
5-8	P12V_CORE

4.3.5 Fan Connectors (FAN1/FAN6-9)



Pin	Signal
1	FAN_CTL
2	FAN_TAC
3	P12V_CORE
4	GND

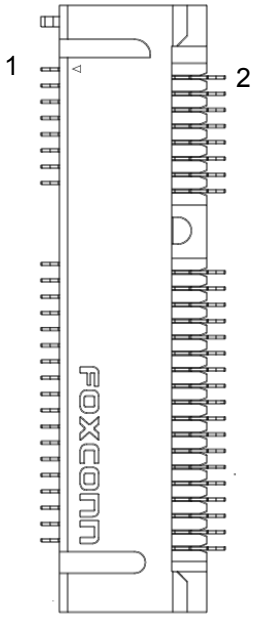
4.3.6 ATX Connector (CN19)



Pin	Signal	Pin	Signal
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GND	15	GND
4	+5V	16	ATX_PSON#
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	F_PWRGD_PS	20	NC
9	P5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND

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4.3.7 mSATA Connectors (CN9/CN48)



Pin	Signal	Pin	Signal
1	NC	2	P3V3
3	NC	4	GND
5	NC	6	P1V5
7	NC	8	NC
9	GND	10	NC
11	NC	12	NC
13	NC	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	NC
21	NC	22	NC
23	RXP0_R	24	P3V3
25	RXN0_R	26	GND
27	GND	28	P1V5
29	GND	30	NC
31	TXN0_R	32	NC
33	TXP0_R	34	GND
35	GND	36	NC
37	GND	38	NC
39	P3V3	40	GND
41	P3V3	42	NC
43	NC	44	NC
45	NC	46	NC
47	NC	48	P1V5
49	NC	50	GND
51	NC	52	P3V3

4.3.8 SATA Connectors (CN30-33)

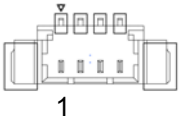


Pin	Signal
1	Ground
2	TXP
3	TXN
4	Ground
5	RXN
6	RXP
7	Ground

NOTE: CN32 is shared with SATADOM.

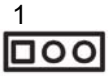
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4.3.9 SATADOM Power Connector (CN18, Wafer 1.25mm pitch)



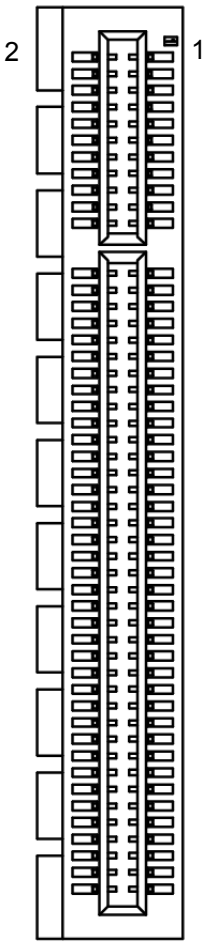
Pin	Signal
1	Ground
2	TXP
3	TXN
4	Ground

4.3.10 Clear CMOS Jumper (JBAT1)



Short Pins	Function
1-2	Normal
2-3	Clear CMOS

4.3.11 NIM Slot connectors (PCI1-4)



Pin	Signal	Pin	Signal
A1	BYPASS_LAN1#	B1	PWR_IO (5V)
A2	PWR_IO (5V)	B2	PWR_IO (5V)
A3	PWR_IO (5V)	B3	PWR_IO (5V)
A4	GND	B4	GND
A5	NC	B5	LAN_SMB_CLK`
A6	NC	B6	LAN_SMB_DATA
A7	NC	B7	GND
A8	NC	B8	P3V3
A9	P3V3	B9	NC
A10	P3V3	B10	P3V3_DUAL
A11	PLT_RESET_PCIE#	B11	PULL P3V3_DUAL
A12	GND	B12	NC
A13	C_100M_NMC_N	B13	GND
A14	C_100M_NMC_N	B14	PCIE-TXP0
A15	GND	B15	PCIE-TXN0
A16	PCIE-RXP0	B16	GND
A17	PCIE-RXN0	B17	NC
A18	GND	B18	GND
A19	NC	B19	PCIE-TXP1
A20	GND	B20	PCIE-TXN1
A21	PCIE-RXP1	B21	GND
A22	PCIE-RXN1	B22	GND
A23	GND	B23	PCIE-TXP2
A24	GND	B24	PCIE-TXN2
A25	PCIE-RXP2	B25	GND
A26	PCIE-RXN2	B26	GND
A27	GND	B27	PCIE-TXP3
A28	GND	B28	PCIE-TXN3

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Pin	Signal	Pin	Signal
A29	PCIE-RXP3	B29	GND
A30	PCIE-RXN3	B30	NC
A31	GND	B31	NC
A32	NC	B32	GND
A33	NC	B33	PCIE-TXP4
A34	GND	B34	PCIE-TXN4
A35	PCIE-RXP4	B35	GND
A36	PCIE-RXN4	B36	GND
A37	GND	B37	PCIE-TXP5
A38	GND	B38	PCIE-TXN5
A39	PCIE-RXP5	B39	GND
A40	PCIE-RXN5	B40	GND
A41	GND	B41	PCIE-TXP6
A42	GND	B42	PCIE-TXN6
A43	PCIE-RXP6	B43	GND
A44	PCIE-RXN6	B44	GND
A45	GND	B45	PCIE-TXP7
A46	GND	B46	PCIE-TXN7
A47	PCIE-RXP7	B47	GND
A48	PCIE-RXN7	B48	NC
A49	GND	B49	GND

NIM Slot connectors (PCI1-4) (con'td)

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5 LAN Bypass Function

The CSA-5100 is equipped with a LAN Bypass function to allow uninterrupted network traffic in the case of power disruption, system failure, or if a single in-line appliance is shut down or hangs. The default behaviour of the LAN Bypass function is determined by BIOS setting Under the following conditions, GPIO signals trigger the LAN bypass mechanism:

- Bypass button on front panel is pushed when the system is powered on.
- System crash occurs (after reboot with Watchdog Timer is running under Linux)
- System is powered on but not running OS (if enabled in BIOS)
- After booting into OS (if enabled in BIOS and Watchdog Timer is not running under Linux)
- Power turned off or disconnected

5.1 Hardware Description

The CSA-5100 can bypass the LAN port on designated NIMs (CSA-Z4X01, CSA-Z8X10).



CSA-5100 LAN Bypass Hardware Layout

(1) Bypass Button:
Enable/Disable LAN bypass by pushing the Bypass Button when the system is powered on.

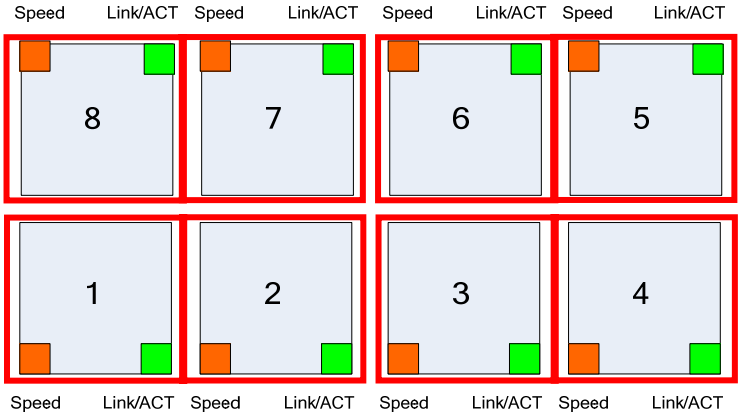
(2) Bypass LED (middle LED) :
Red: Bypass enabled
Off: Bypass disabled

(3) LAN Bypass Port Pairing (CSA-Z4X01)

LAN Bypass Pair 1: LAN1 & LAN2
LAN Bypass Pair 2: LAN3 & LAN4

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CSA-Z8X10 LAN Bypass Port Pairing



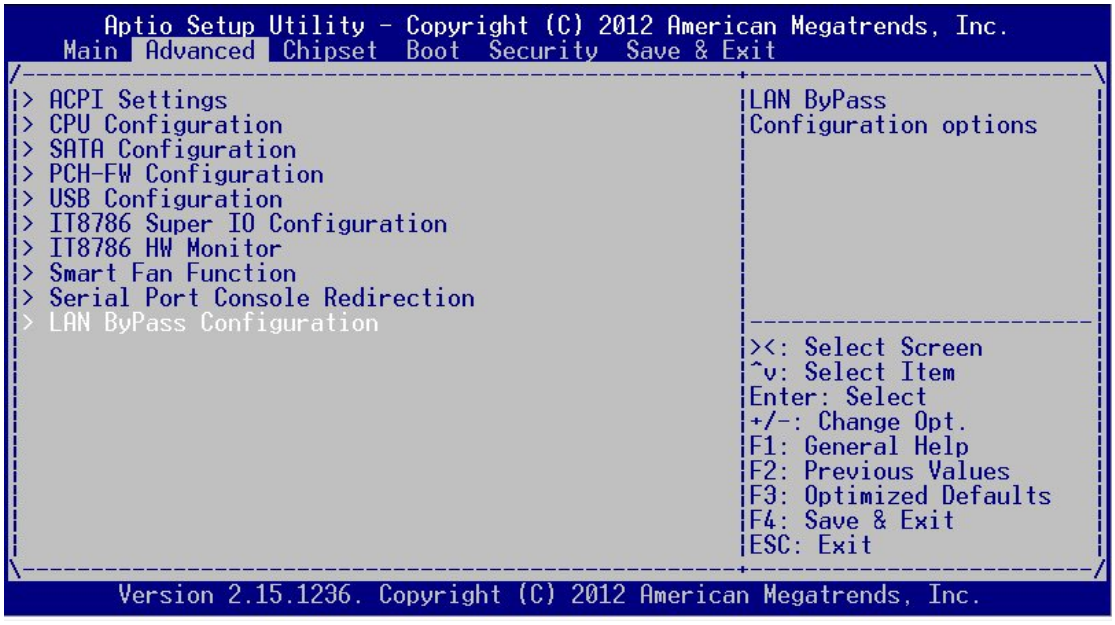
LAN Bypass Pair 1: LAN1 & LAN2
LAN Bypass Pair 2: LAN3 & LAN4
LAN Bypass Pair 3: LAN5 & LAN6
LAN Bypass Pair 4: LAN7 & LAN8

5.2 BIOS Settings

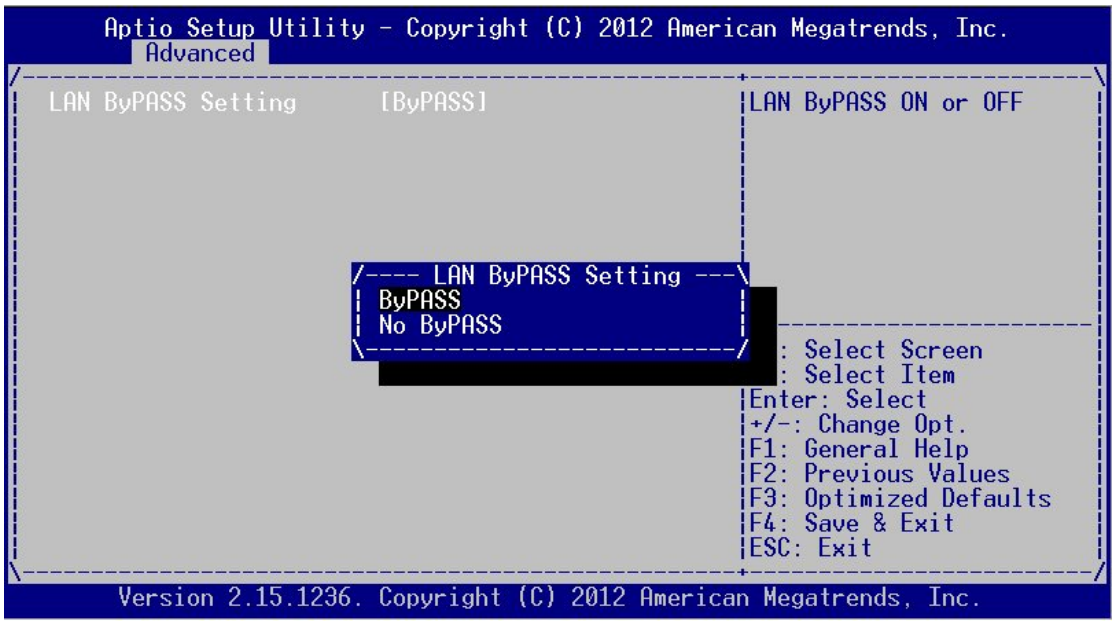
The default behaviour of the CSA-5100's LAN Bypass function is set in the BIOS.

- **Bypass Enabled:** LAN Bypass is *enabled* until the system boots into OS and is disabled by software control or by pushing the Bypass Button.
- **Bypass Disabled:** LAN Bypass is *disabled* until the system boots into OS and is enabled by software control or by pushing the Bypass Button.

The LAN Bypass BIOS setting is set by entering the BIOS setup menu: Advanced > LAN Bypass Configuration > LAN Bypass Setting, choose "Bypass" or "No Bypass". The BIOS factory default setting is "No Bypass".



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5.3 SuperIO Watchdog Driver & API

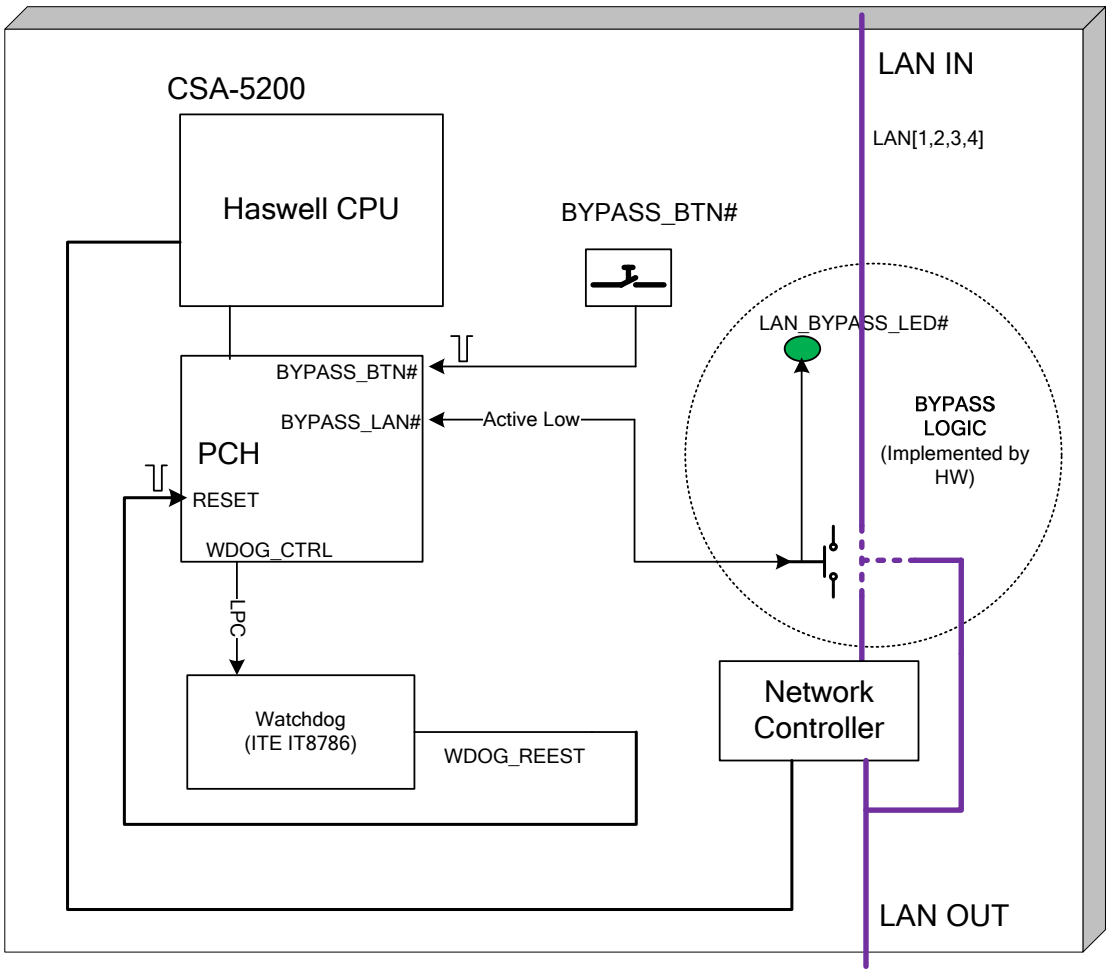
A SuperIO Watchdog Driver and API (Linux only) is available to enable LAN bypass by software control and to reboot the system when a crash occurs (LAN bypass can be enabled on system restart). To make use of this feature, first install a Linux OS, and then install the SuperIO Watchdog Driver.

5.3.1 Overview

A Watchdog Timer (WDT) is a hardware circuit that can reset the computer system in case of a software fault. Usually a user space daemon will notify the kernel watchdog driver via the /dev/watchdog special device file that user space is still alive, at regular intervals. When such a notification occurs, the driver will usually tell the hardware watchdog that everything is in order, and that the watchdog should wait for period of time to reset the system. If user space fails (RAM error, kernel bug, etc.), the notifications cease to occur, and the hardware watchdog will reset the system (causing a reboot) after the timeout occurs.

The figure below depicts all logical blocks in the CSA-5100 SuperIO watchdog implementation.

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Logical Blocks in the Watchdog Implementation

The watchdog is controlled by writing to the SuperIO registers. The BYPASS_LAN# signal will indicate whether LAN bypass is activated. When the BYPASS_LAN# output is 0 (active-low), the CSA-5100 hardware will bypass the LAN inputs (LAN1, LAN2, LAN3, LAN4). When the BYPASS_LAN# output is 1 (inactive), the CSA-5100 hardware will take in the LAN inputs for IP package inspection and security processing. The various pin functions are described as follows.

- **BYPASS_BTN#**: issue a low pulse after the button is pushed. The BIOS routine will read the bypass button status, then trigger BYPASS_LAN# when the button is pushed. Linux watchdog software need NOT handle the BYPASS_BTN#.
- **BYPASS_LAN#**: active low. Both BIOS and Linux watchdog software can read and change this GPIO status. LAN bypass is activated when BYPASS_LAN# is set to 0 (active-low).
- **WDOG_CTRL**: LPC bus. Both BIOS and Linux can control the SuperIO watchdog by writing its registers over LPC bus.
- **WDOG_RESET**: issue low pulse when feeding fails. A system reset will be triggerered if WDT_ENABLE is set to 1. After a system reset, BYPASS_LAN# is set to 0 (active-low) automatically by the BIOS.
- **LAN_BY_LED#**, lit when BYPASS_LAN# is set to low. The feature is implemented by pure hardware logic and there is no control required by BIOS/Linux software.

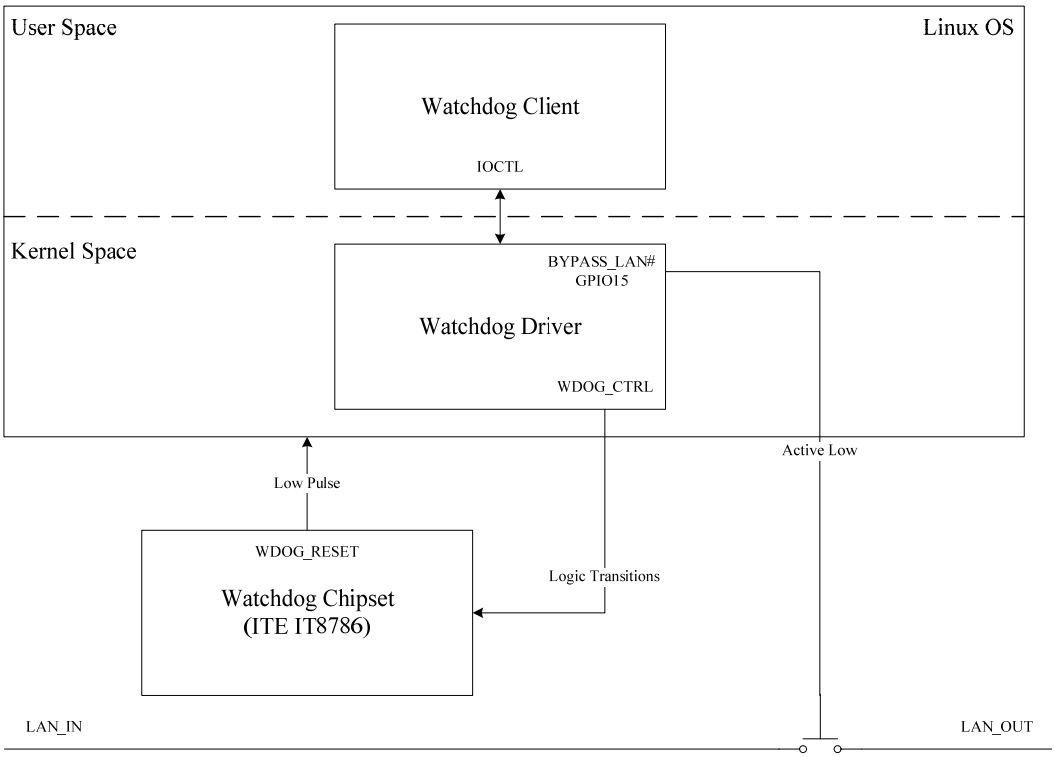
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6 Watchdog Timer Programming

Some applications require a server to intelligently switch the LAN bypass mode off and on. ADLINK has developed SuperIO watchdog APIs for the CSA-5100 to meet the needs of these application scenarios. First, we will introduce the overall software architecture for programming. Secondly, we will define the released deliverables, including source file, makefile, readme, install script and sample test program. Finally, detailed API definitions and references will be presented to allow customers to easily program their applications.

6.1 Architecture Overview

All the APIs listed in this document are programmed according to the following logical block architecture, shown as Figure 1. In this figure, the client is running in user space of the Linux OS and driver in kernel space.



Logical Block Architecture for Watchdog Timer Programming

The watchdog is controlled by writing to the SuperIO registers implemented from the watchdog driver. The BYPASS_LAN# signal will indicate whether LAN bypass is activated. When the BYPASS_LAN# output is 0 (active-low), the CSA-5100 hardware will bypass the LAN inputs. When the BYPASS_LAN# output is 1, the CSA-5100 hardware will take in the LAN inputs for IP package inspection and security processing. The various pin functions belonging to the Watchdog Driver are described as follows.

- **BYPASS_LAN#** (active-low). Both the BIOS and Linux watchdog software can read and change the status of this signal. LAN bypass is activated when BYPASS_LAN# is set to 0.
- **WDOG_CTRL** (active-high). Linux can use this pin to enable/disable the watchdog.

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6.2 Deliverables

The CSA-5100 SuperIO Watchdog Software deliver package (SuperIO_WDT-x.x.x.tar.gz) provides the following software components.

superio_watchdog (directory): Watchdog Driver
- src: Watchdog Driver source code
- autorun.sh: Install script
- README: Quick guide
- Makefile

superio_wdt_test (directory): Watchdog Client
-watchdog-test.c: Watchdog client source code
-Makefile

6.2.1 open

The watchdog provides an open() interface, which is “/dev/watchdog” handling. Seek is not supported in this feature. The Watchdog timer is started when a user application opens the watchdog module. The Watchdog Driver disables LAN bypass (BYPASS_LAN#) when the user opens the watchdog.

PROTOTYPE
static int open(struct inode *inode, struct file *file)

DESCRIPTION
This function is used to open “/dev/watchdog” handling.
int open(const char *pathname, int flags) may be used in client to call this feature.

PARAMETERS
pathname [IN] Pathname which locates watchdog device file.
flags [IN] Access permission bits. “O_RDONLY” read only, “O_WRONLY” write only, “O_RDWR” read/write.

RETURN
File descriptor: success
-1: error

6.2.2 write

The Watchdog Driver provides a write() interface. A write to a watchdog device is defined as a keepalive signal. After receiving a write call, the Watchdog Driver will do the watchdog feeding.

As the content is not defined, any character will do except the character “V”, which is the signal for “Magic Close”. The driver will not disable the watchdog unless a specific magic character 'V' has been sent to “/dev/watchdog” just before closing the file. If the user space daemon closes the file without sending this special character, the driver will assume that the daemon (and user space in general) died, and will stop the watchdog without disabling it first. This will then cause a reboot if the watchdog is not re-opened in sufficient time.

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PROTOTYPE
static ssize_t write(struct file *file, const char __user *data,size_t len, loff_t *ppos)

DESCRIPTION
This function is used to write information to be given to watchdog device.
int write(int handle, void *buf, int nbyte) may be used in client to call this feature.

PARAMETERS
handle [IN] File handle to the watchdog;
buf [IN] Buffer to write;
nbyte [IN] Count of bytes;

RETURN
Number of bytes actually written: success
-1: error

6.2.3 ioctl

The Watchdog Driver provides several ioctl options:

WDIOS_DISABLECARD, used to turn off the watchdog timer. The Watchdog Driver support module parameter WATCHDOG_NOWAYOUT. If it is set, there is no way of disabling the watchdog once it has been started. So, if the watchdog daemon crashes, the system will reboot after the timeout has passed.

WDIOS_ENABLECARD, used to turn on the watchdog timer.

WDIOC_SETOPTIONS, used to set the watchdog status.

WDIOC_GETSTATUS, used to determines the status supported by watchdog ioctl. The status bit of the device does not allow distinguishing between a regular system reset and a watchdog forced reset. But, in test mode it is useful, so it is supported through WDIOC_GETSTATUS watchdog ioctl. Additionally the driver reports the keepalive signal and the acception of the magic.

WDIOC_SETTIMEOUT, used to change the watchdog timeout parameter (1s-255s). The Watchdog Driver support module parameter DEFAULT_TIMEOUT. If it set then the Watchdog Driver will use it as the watchdog timeout parameter. If it is not set, the default watchdog timeout parameter is 5s.

WDIOC_GETTIMEOUT, used to query the watchdog timeout parameter.

WDIOC_KEEPALIVE, used to feed the watchdog, just like the write () interface.

WDIOC_ENABLEBYPS, which is a custom command, used to enable the LAN bypass. Defined as below:

#define WDIOC_ENABLEBYPS _IOR(WATCHDOG_IOCTL_BASE, 101, int)

WDIOC_DISABLEBYPS, which is a custom command, used to disable the LAN bypass. Defined as below:
#define WDIOC_DISABLEBYPS _IOR(WATCHDOG_IOCTL_BASE, 102, int)

PROTOTYPE
static long ioctl(struct file *file, unsigned int cmd, unsigned long arg)

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DESCRIPTION
This function defines functions for the watchdog device according to the available features.
int ioctl(int handle, int cmd,[int *argdx, int argcx]) may be used in client to call this feature.

PARAMETERS
handle [IN] File handle to the watchdog;
cmd [IN] Watchdog command, such as “WDIOC_xxx”;
argxx [IN/OUT] Argument pointer, such as“WDIOS_xxx”, only used after WDIOC_SETOPTIONS.

RETURN
0: success
-1: error

6.2.4 release

The Watchdog Driver provides several ioctl options:

Closing the watchdog device either stops the watchdog timer or in the case that nowayout is set or the magic character wasn't written, a critical warning about a running watchdog timer will be given.

PROTOTYPE
static int release(struct inode *inode, struct file *file)

DESCRIPTION
This function is used to check whether the watchdog device closing is expected or not. This feature will be called automatically when closing the watchdog device file “/dev/watchdog”.

6.3 Sample Code

The following sample code is provided to illustrate how the SuperIO Watchdog timer and LAN bypass control can be implemented.

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <unistd.h>
#include <fcntl.h>
#include <sys/ioctl.h>
#include <linux/types.h>
#include <linux/watchdog.h>

#define WDIOC_ENABLEBYPS    _IOR(WATCHDOG_IOCTL_BASE, 101, int)
#define WDIOC_DISABLEBYPS   _IOR(WATCHDOG_IOCTL_BASE, 102, int)

int fd;

/*
 * This function simply sends an IOCTL to the driver, which in turn ticks
```


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```
 * the Watchdog to reset its internal timer so it doesn't trigger
 * a computer reset.
 */
static void keep_alive(void)
{
  int dummy;

  ioctl(fd, WDIOC_KEEPALIVE, &dummy);
}

/*
 * The main program.  Run the program with "-d" to disable the card,
 * or "-e" to enable the card.
 */
int main(int argc, char *argv[])
{
  int flags;

  if(argc == 2 && !strncasecmp(argv[1], "-h", 2))
  {
    fprintf(stderr, "wdogfeed options:\n");
    fprintf(stderr, "-e<1|0>:    Turn on/off the watchdog timer.\n");
    fprintf(stderr, "-b<1|0>:    Enable/disable the bypass lan.\n");
    fprintf(stderr, "-t:         Query the watchdog timeout parameter.\n");
    fprintf(stderr, "-s:          Change the watchdog timeout parameter.\n");
    fprintf(stderr, "For example:\n");
    fprintf(stderr, "./wdt-test -h      // Print the help menu\n");
    fprintf(stderr, "./wdt-test -e 0    // Turn off the watchdog timer\n");
    fprintf(stderr, "./wdt-test -b 0    // Disable the bypass lan\n");
    fprintf(stderr, "./wdt-test -t      // Query watchdog timeout period\n");
    fprintf(stderr, "./wdt-test -s 10  // Set watchdog timeout period to 10s\n");
    fflush(stderr);
    exit(0);
  }

  fd = open("/dev/watchdog", O_WRONLY);

  if (fd == -1)
  {
    fprintf(stderr, "Watchdog device not enabled.\n");
    fflush(stderr);
    exit(-1);
  }

  if (argc > 1)
  {
    if (!strncasecmp(argv[1], "-e", 2))
    {
      if(!strncasecmp(argv[2], "1", 1))
      {
        flags = WDIOS_ENABLECARD;
        ioctl(fd, WDIOC_SETOPTIONS, &flags);
        fprintf(stderr, "Watchdog card enabled.\n");
        fflush(stderr);
        exit(0);
      }
      if(!strncasecmp(argv[2], "0", 1))
```


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```
        {
          flags = WDIOS_DISABLECARD;
          ioctl(fd, WDIOC_SETOPTIONS, &flags);
          fprintf(stderr, "Watchdog card disabled.\n");
          fflush(stderr);
          exit(0);
        }
      }
      else if (!strncasecmp(argv[1], "-t", 2))
      {
        ioctl(fd, WDIOC_GETTIMEOUT, &flags);
        fprintf(stderr, "Timeout period:%d\n", flags);
        fflush(stderr);
        exit(0);
      }
      else if (!strncasecmp(argv[1], "-s", 2))
      {
        sscanf(argv[2], "%d", &flags);
        ioctl(fd, WDIOC_SETTIMEOUT, &flags);
        fprintf(stderr, "Set watchdog timeout period to %ds\n", flags);
        fflush(stderr);
        exit(0);
      }
      else if (!strncasecmp(argv[1], "-b", 2))
      {
        if(!strncasecmp(argv[2], "1", 1))
        {
          ioctl(fd, WDIOC_ENABLEBYPS, &flags);
          fprintf(stderr, "Bypass lan enabled.\n");
          fflush(stderr);
          exit(0);
        }
        if(!strncasecmp(argv[2], "0", 1))
        {
          ioctl(fd, WDIOC_DISABLEBYPS, &flags);
          fprintf(stderr, "Bypass lan disabled.\n");
          fflush(stderr);
          exit(0);
        }
      }
    }
    else
    {
      fprintf(stderr, "Watchdog Ticking Away!\n");
      fflush(stderr);
    }

    while(1)
    {
      keep_alive();
      //write(fd, "0", 1);
      usleep(500000);
    }
}
```


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7 BIOS Setup

The following chapter describes basic navigation for the CSA-5100 BIOS setup utility.

7.1 Entering BIOS Setup

To enter the setup screen, follow these steps:

1. Power on the motherboard
2. Press the < Delete > key on your keyboard when you see the following text prompt: < Press DEL to enter Setup >
3. After you press the < Delete > key, the main BIOS setup menu displays. You can access the other setup screens from the main BIOS setup menu, such as Chipset and Power menus.

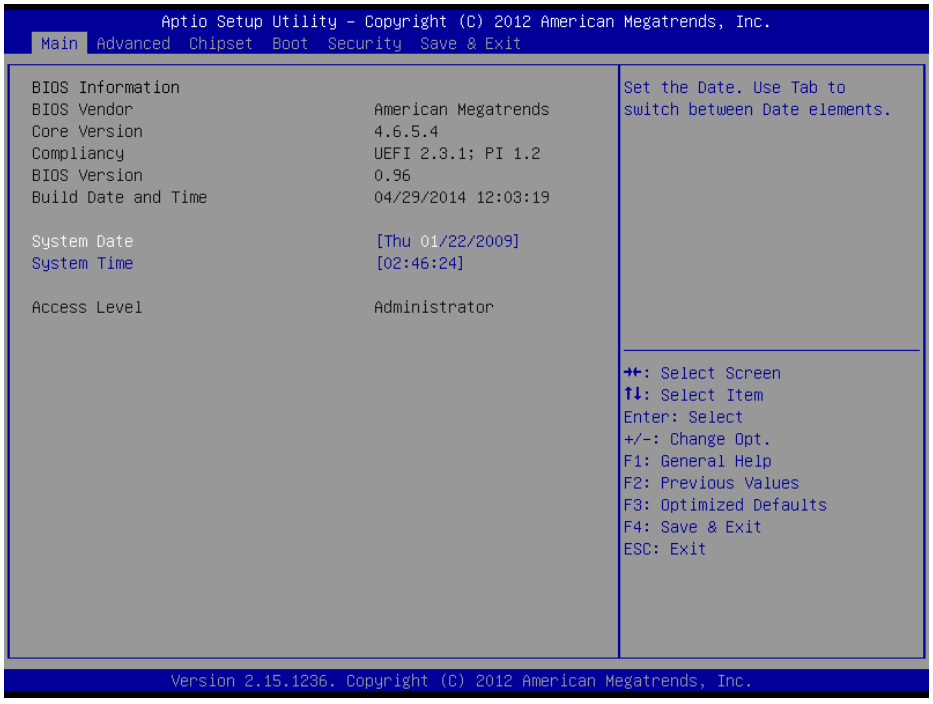


NOTE: In most cases, the < Delete > key is used to invoke the setup screen. However, there are several cases that use other keys, such as < F1 >, < F2 >, and so on.

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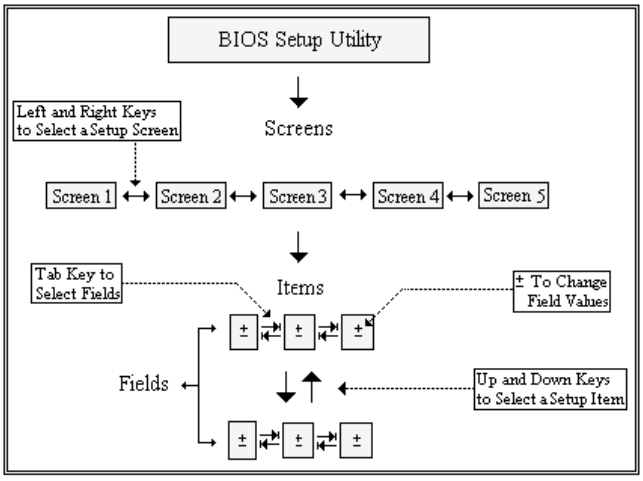
7.2 Setup Menu

The Main BIOS setup menu is the first screen that you can navigate to. The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. “Grayed” options cannot be configured, and “Blue” options can be. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.



7.3 Navigation

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

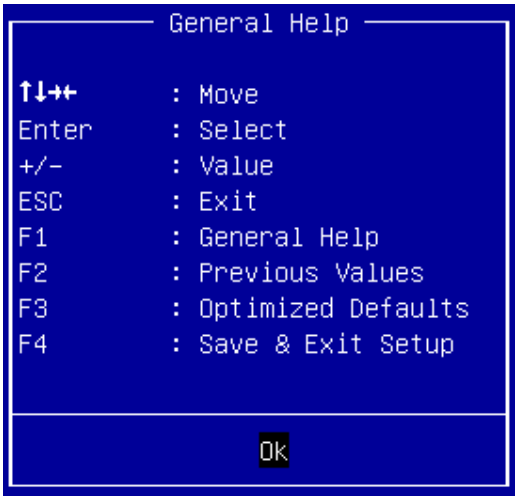


NOTE: There is a hot key legend located in the right frame on most setup screens.

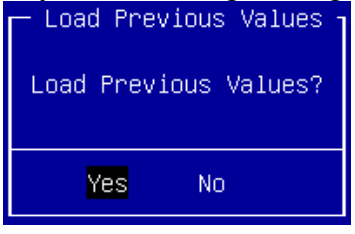
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→←	Left/Right. The *Left and Right* < Arrow > keys allow you to select a setup screen. For example: Main screen, Advanced screen, Chipset screen, and so on.
↑↓	Up/Down The *Up and Down* < Arrow > keys allow you to select a setup item or sub-screen.
+-	Plus/Minus The *Plus and Minus* < Arrow > keys allow you to change the field value of a particular setup item. For example: Date and Time.
Tab	The < Tab > key allows you to select setup fields.

Hot Key	Description
Enter	The < Enter > key allows you to display or change the setup option listed for a particular setup item. The < Enter > key can also allow you to display the setup sub-screens.
F1	The < F1 > key allows you to display the General Help screen. Press the < F1 > key to open the General Help screen.

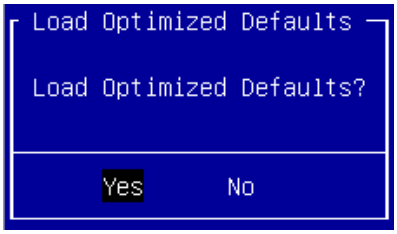
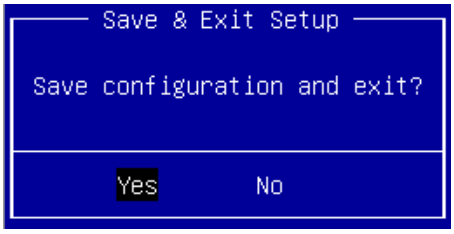
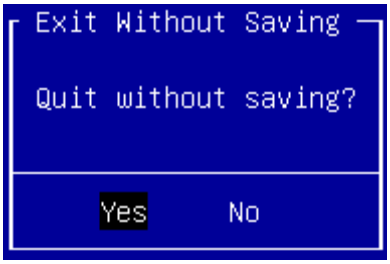


F2	The < F2 > key on your keyboard is the previous values key. It is not displayed on the key legend by default. To set the previous values settings of the BIOS, press the < F2 > key on your keyboard. It is located on the upper row of a standard 101 keyboard. The previous value settings allow the motherboard to boot up with the least amount of options set. This can lessen the probability of conflicting settings.



Press the < Enter > key to load previous values. You can also use the < Arrow > key to select *Cancel* and then press the < Enter > key to abort this function and return to the previous screen.

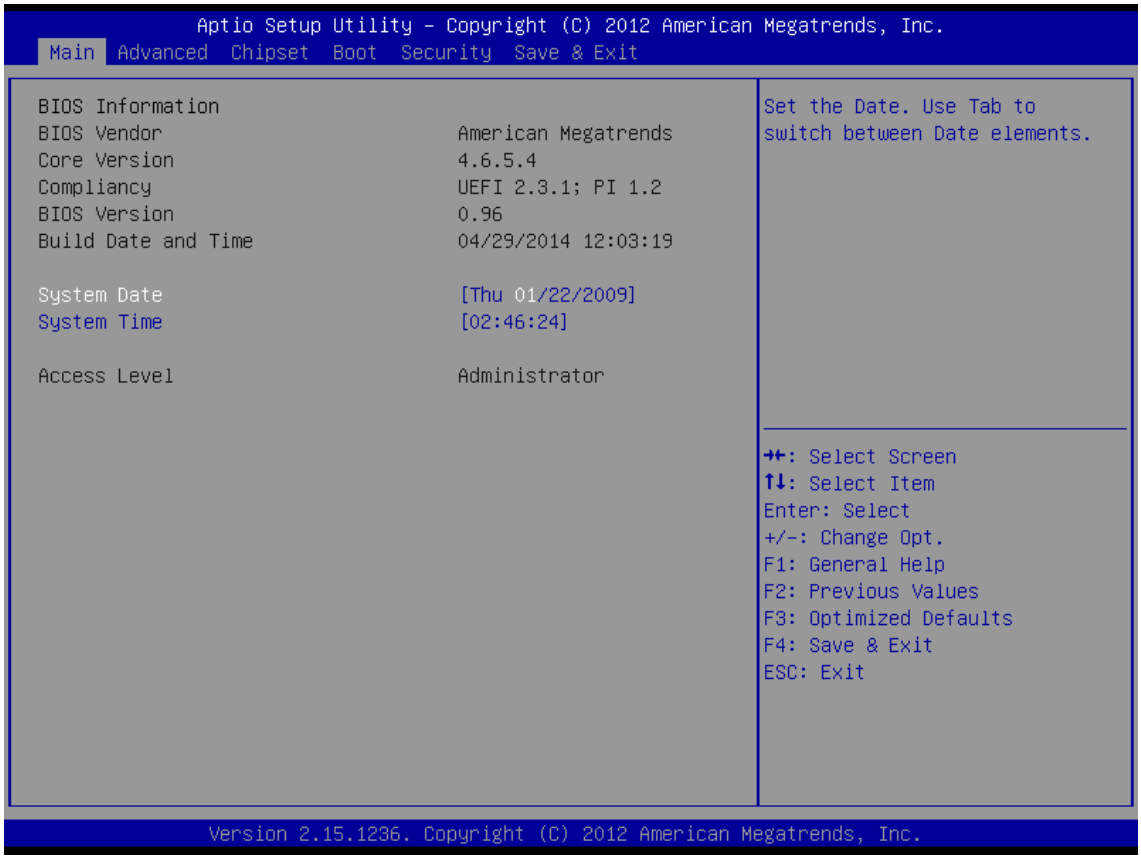
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F3	The < F3 > key on your keyboard is the optimized defaults key. To set the optimized defaults settings of the BIOS, press the < F3 > key on your keyboard. It is located on the upper row of a standard 101 keyboard. The optimized defaults settings allow the motherboard to boot up with the optimized defaults of options set. This can lessen the probability of conflicting settings.  Press the < Enter > key to load optimized defaults. You can also use the < Arrow > key to select *Cancel* and then press the < Enter > key to abort this function and return to the previous screen.
F4	The < F4 > key allows you to save any changes you have made and exit Setup. Press the < F4 > key to save your changes. The following screen will appear:  Press the < Enter > key to save the configuration and exit. You can also use the < Arrow > key to select *Cancel* and then press the < Enter > key to abort this function and return to the previous screen.
ESC	The < Esc > key allows you to discard any changes you have made and exit the Setup. Press the < Esc > key to exit the setup without saving your changes. The following screen will appear:  Press the < Enter > key to discard changes and exit. You can also use the < Arrow > key to select *Cancel* and then press the < Enter > key to abort this function and return to the previous screen.

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7.4 Main Setup

When you first enter the Setup Utility, you will find the Main setup screen. You can always return to the Main setup screen by selecting the *Main* tab. There are two Main Setup options. They are described in this section. The Main BIOS Setup screen is shown below.



7.4.1 System & Board Info

The Main BIOS setup screen reports processor, memory and board information.

BIOS Vendor
Displays the BIOS vendor.

Core Version
Displays the BIOS core version.

Compliancy Version
Displays the current UEFI Specification version.

BIOS Version
Displays the current BIOS version.

Build Data and Time
Displays the BIOS build data and time.

System Language
Displays default system language.

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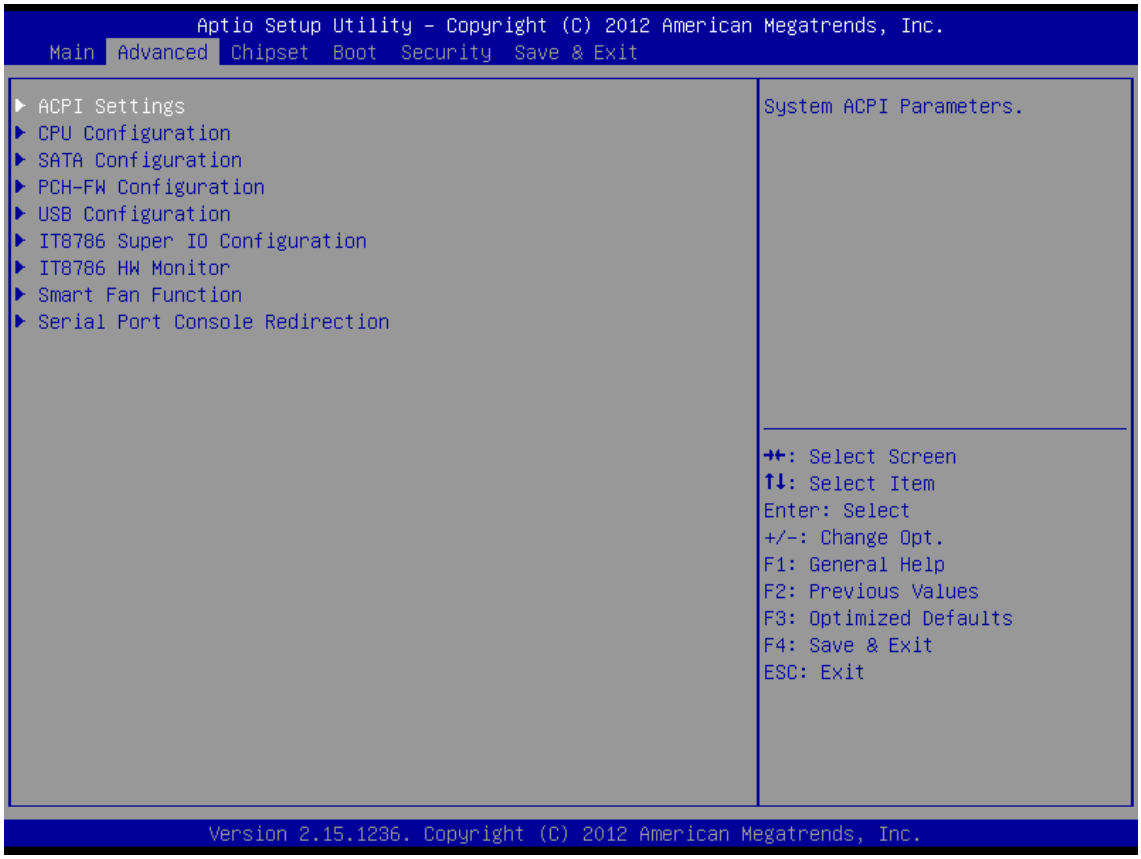
7.4.2 System Date/System Time

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

NOTE: The time is in 24-hour format. For example, 5:30 A.M. appears as 05:30:00, and 5:30 P.M. as 17:30:00.

7.5 Advanced BIOS Setup

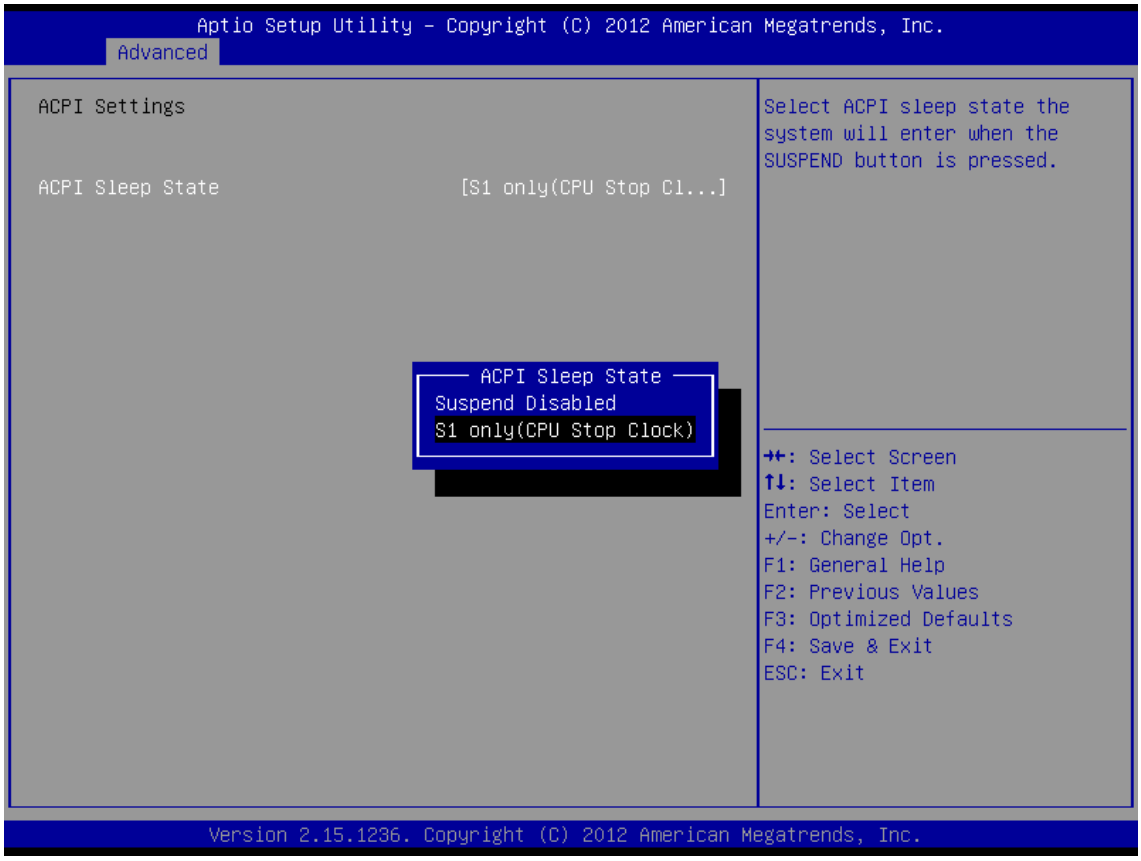
Select the *Advanced* tab from the setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, (ex: Super IO Configuration), to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the < Arrow > keys. The Advanced BIOS Setup screen is shown below. The sub menus are described on the following pages.



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7.5.1 ACPI Settings

You can use this screen to select options for the ACPI Advanced Configuration Settings. Use the up and down < Arrow > keys to select an item. Use the < + > and < - > keys to change the value of the selected option. A description of the selected item appears on the right side of the screen. The settings are described on this page. The screen is shown below.



ACPI Sleep State

Select the highest ACPI sleep state the system will enter, when the SUSPEND button is pressed. Set this value to **S1 (CPU Stop Clock)/ Suspend Disable.**

S1(CPU Stop Clock)

Power On Suspend - Under this setting the CPU is not executing instructions, all power resources that supply system level reference of S0 are off, system memory context is maintained, devices that reference power resources are on, and devices that can wake-up the system can cause the CPU to continue to execute from where it left off.

7.5.2 CPU Configuration

You can use this screen to select options for the CPU Configuration Settings. Use the up and down < Arrow > keys to select an item. Use the < + > and < - > keys to change the value of the selected option. A description of the selected item appears on the right side of the screen. The settings are described on the following pages. An example of the *CPU Configuration* screen is shown below.

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Hyper-threading

Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology).

Options	
Enabled	For Windows XP and Linux (OS optimized for Hyper-Threading Technology).
Disabled	For other OS (OS not optimized for Hyper-Threading Technology).

Active Processor Core

Number of cores to enable in each processor package.
Set this value to **All, 1, 2, 3.**

Intel Virtualization Technology

When enabled, a VMM can utilize the additional hardware capability provided by Vanderpool Technology. Set this value to **Enabled/Disabled.**

EIST

Enable Intel SpeedStep Technology support. Set this value to **Enabled/Disabled.**

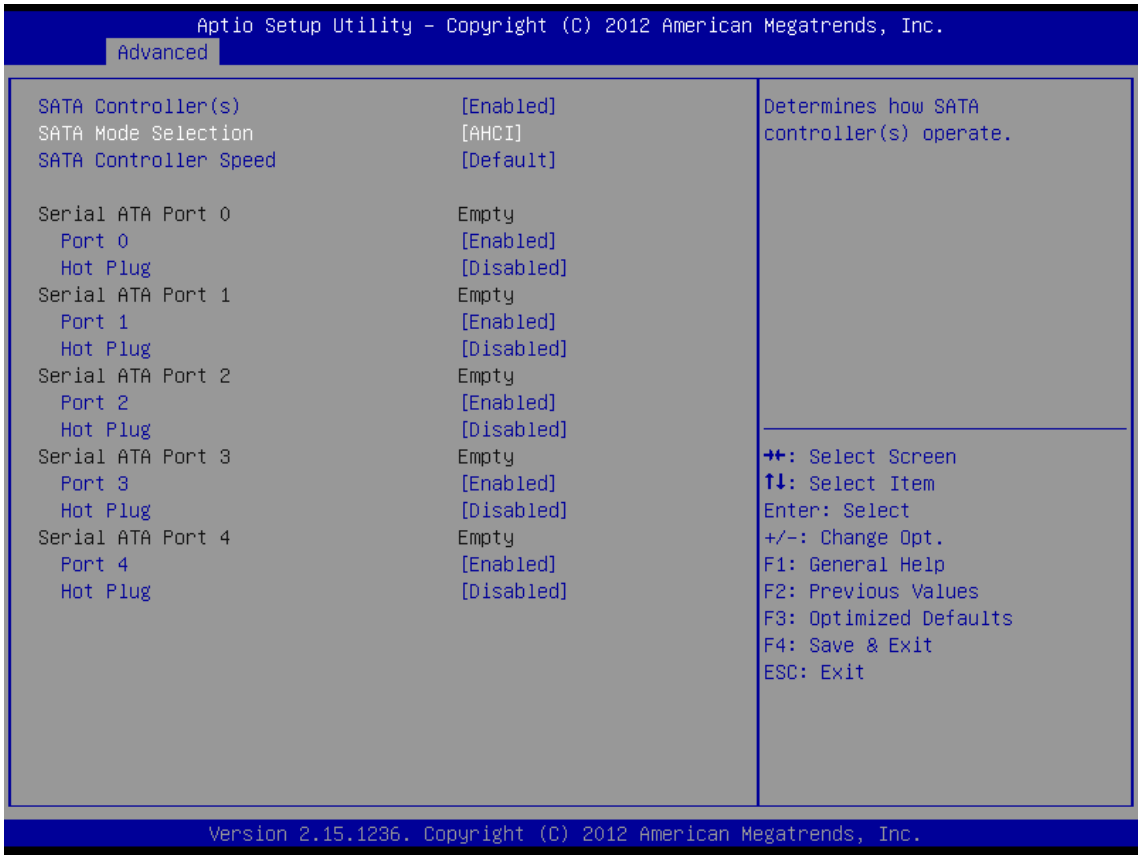
Turbo Mode

Enable Intel Turbo Boost support. Set this value to **Enabled/Disabled.**

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7.5.3 SATA Configuration

You can use this screen to select options for the SATA Configuration Settings. An example of the *SATA Configuration* screen is shown below.



SATA Controller(s)

Enables or disables SATA device.

SATA Mode Selection

The SATA can be configured as a legacy **IDE, AHCI** and **RAID** mode.

NOTE: When system is in RAID mode and the user needs to setup BIOS, do NOT push the NumLock button, otherwise, it is possible to make the BIOS hang. If the BIOS hangs, reset system.

SATA Port 0-4

Displays SATA device name string.

Port 0-4

Enable or disable the SATA Port.

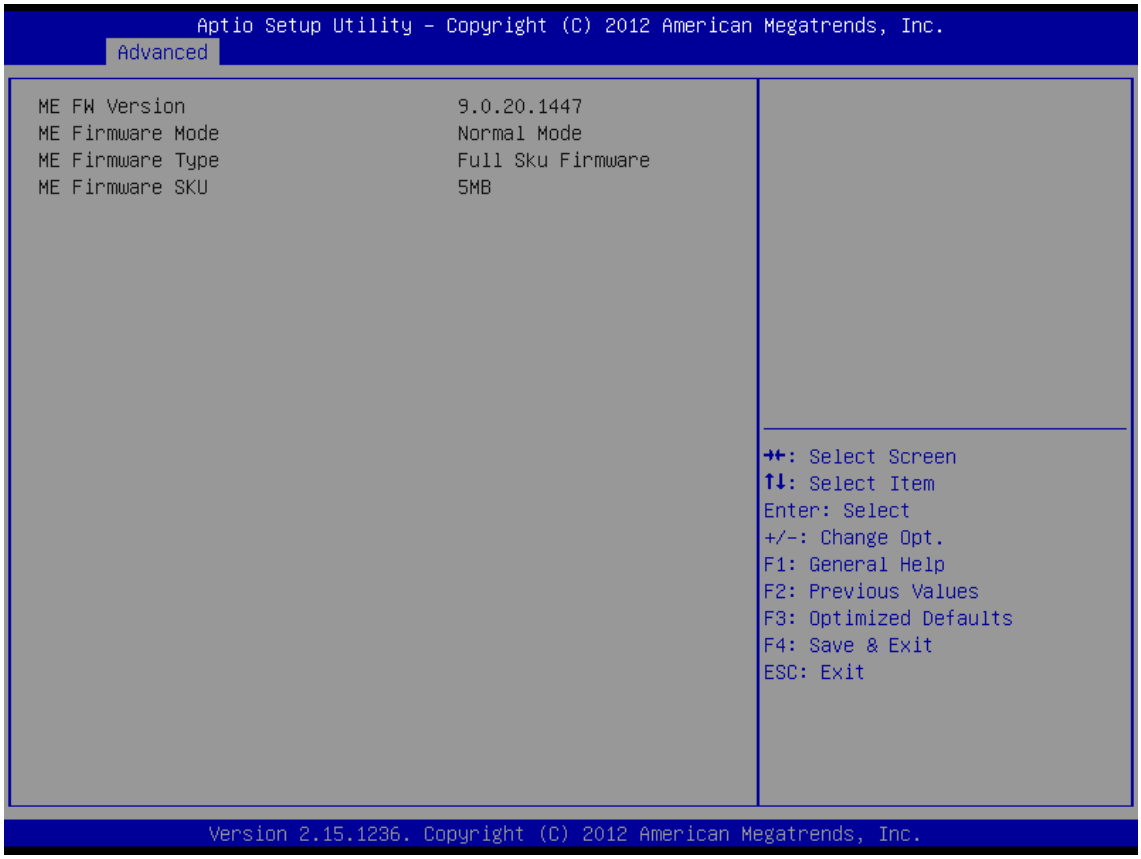
Hot Plug

Appears when SATA mode is set to AHCI. SATA Ports Hot Plug support. Set this value to **Enabled/Disabled.**

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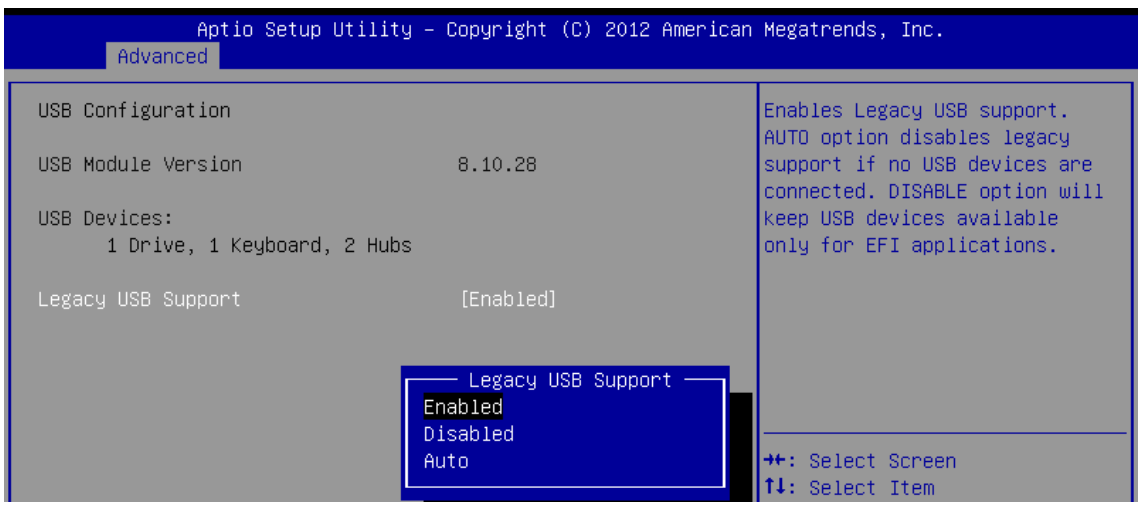
7.5.4 PCH-FW Configuration

You can use this screen to check Intel Management Engine (ME) firmware status. The information is described on the following pages.



7.5.5 USB Configuration

You can use this screen to select options for the USB Configuration Settings. Use the up and down < Arrow > keys to select an item. Use the < + > and < - > keys to change the value of the selected option. A description of the selected item appears on the right side of the screen. The settings are described on the following pages. An example of the *USB Configuration* screen is shown below.



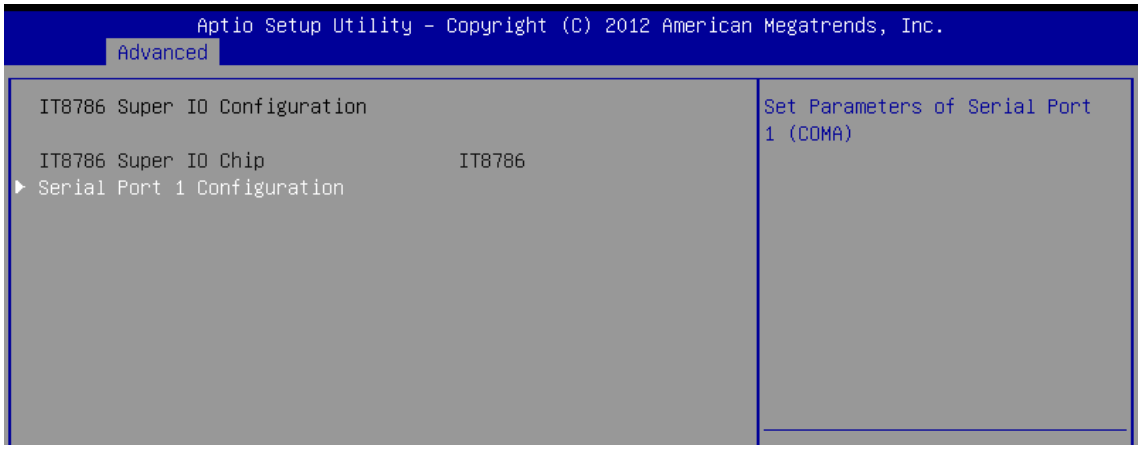
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Legacy USB Support

Enables legacy USB support. Auto option disables legacy support if no USB devices are connected. The disable option will keep USB devices available only for EFI applications. Set this value to **Enabled/Disabled/Auto.**

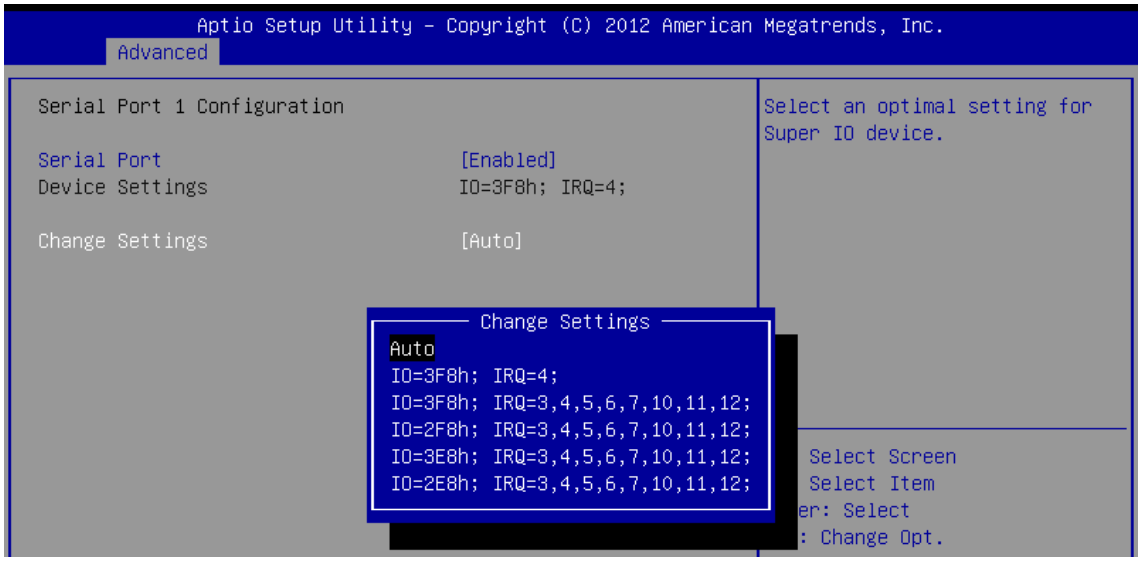
7.5.6 Super IO Configuration

You can use this screen to select options for the Super IO settings. Use the up and down < Arrow > keys to select an item. Use the < + > and < - > keys to change the value of the selected option. The settings are described on the following pages. The screen is shown below.



Serial Port 1 Configuration

Set parameters of Serial Port 1.
Set this value to **Enabled/Disabled**. The screen is shown below.



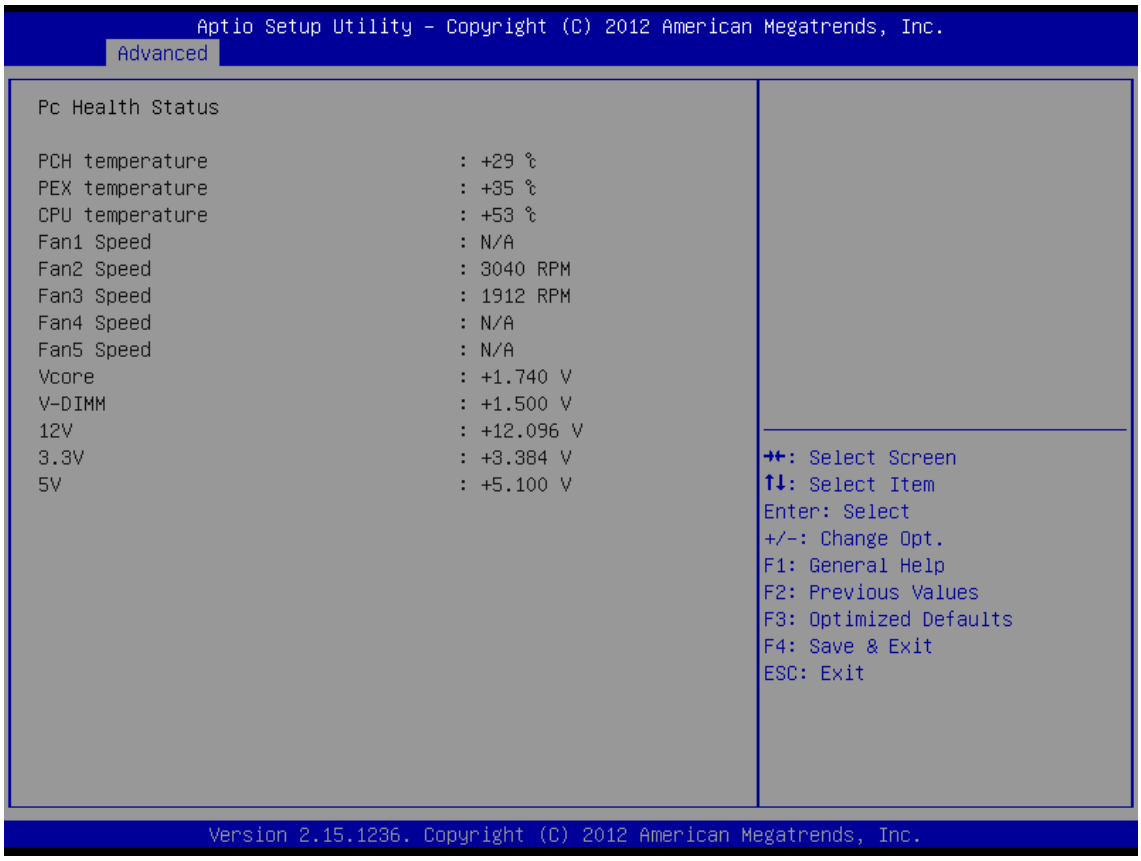
Serial Port

Enable or disable Serial Port 1.

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7.5.7 IT8786 HW Monitor

You can use this screen to check PC health status. The information will be described on the following pages.



PCH Temperature

Displays current PCH temperature.

PEX Temperature

Displays current PEX temperature.

CPU Temperature

Displays current CPU temperature.

Fan1 - Fan5 speed

Displays current system Fan RPM.

Vcore

Displays current system Vcore voltage.

V-DIMM

Displays current system V-DIMM voltage.

3.3V

Displays current system 3.3V voltage.

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5V

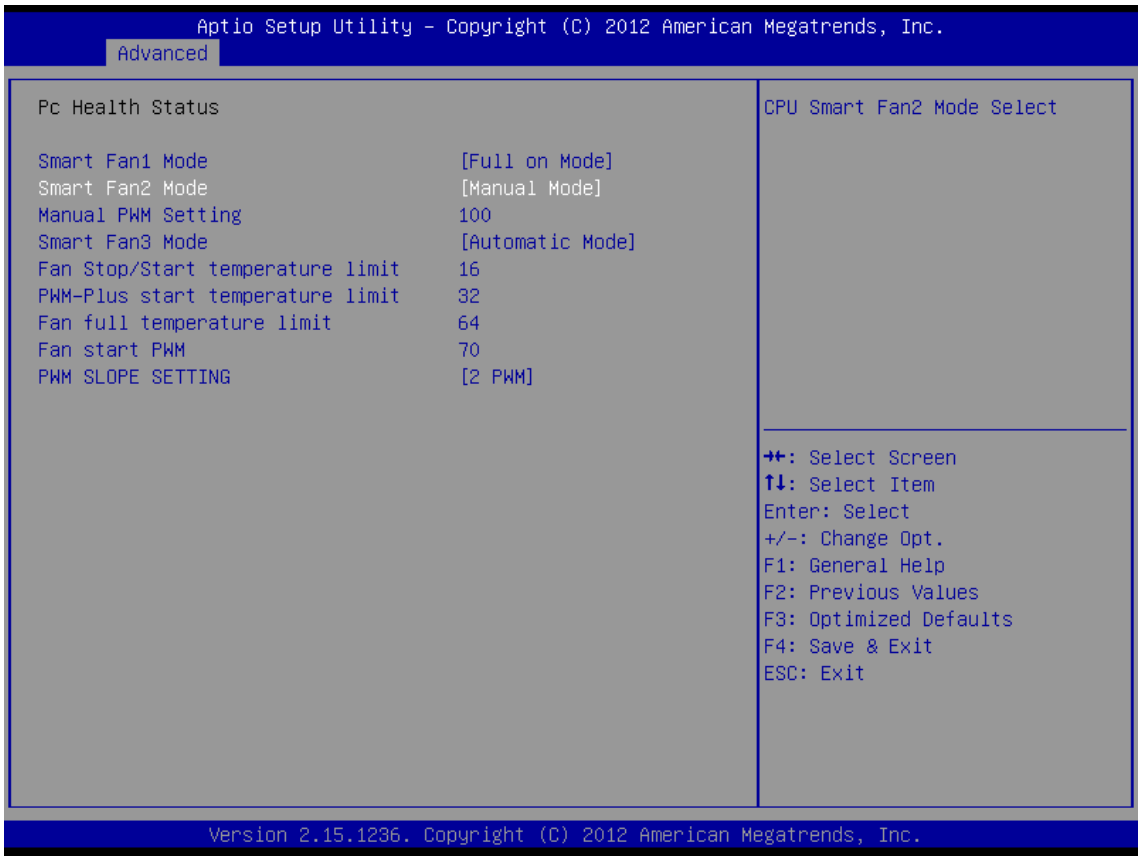
Displays current system 5V voltage.

12V

Displays current system 12V voltage.

7.5.8 Smart Fan Function

You can use this screen to select options for the Smart Fan settings. Use the up and down < Arrow > keys to select an item. Use the < + > and < - > keys to change the value of the selected option. A description of the selected item will appear on the right side of the screen. The settings are described in the following pages. An example of the Smart Fan screen is shown below.



Smart Fan Mode

Full on Mode

Fan on full speed.

Automatic Mode

Fan Stop/Start temperature limit

Fan will stop when temperature lower than this limit, and start when temperature is higher than this limit.

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PWM-Plus start temperature limit

FAN will start addition RPM, when temperature is higher than this limit.

Fan full temperature limit

Fan will work at full speed when temperature is higher than this limit.

Fan start PWM

Fanwill start with this PWM value.

PWM Slope Setting

PWM Slope Selection, 1 PWM, 2 PWM, 4 PWM, 8 PWM, 15.875 PWM.

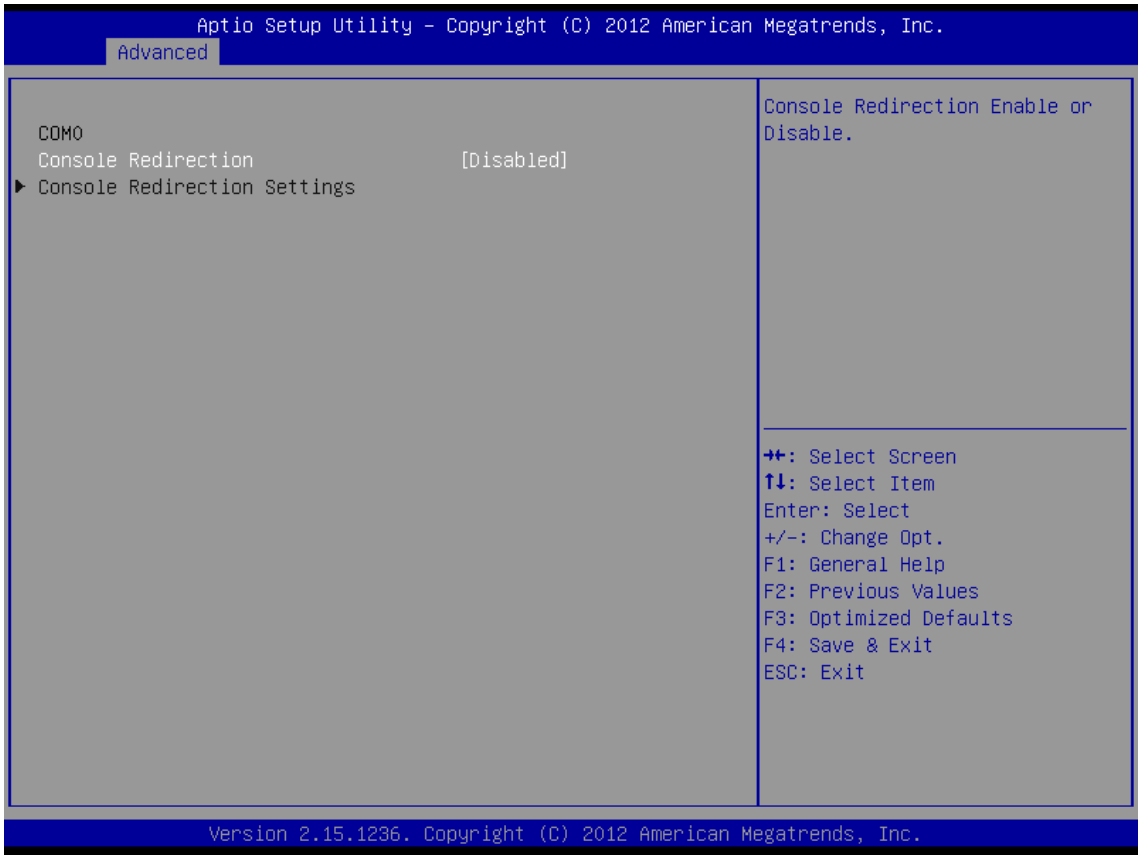
Manual Mode

Manual PWM Setting

Fan will work with this Manual PWM Value. The maximum is 255.

7.5.9 Serial Port Console Redirection

You can use this screen to select options for the serial port console redirection settings. Use the up and down < Arrow > keys to select an item. Use the < + > and < - > keys to change the value of the selected option. A description of the selected item appears on the right side of the screen. The settings are described in the following pages. An example of the *Serial Port Console Redirection* screen is shown below.



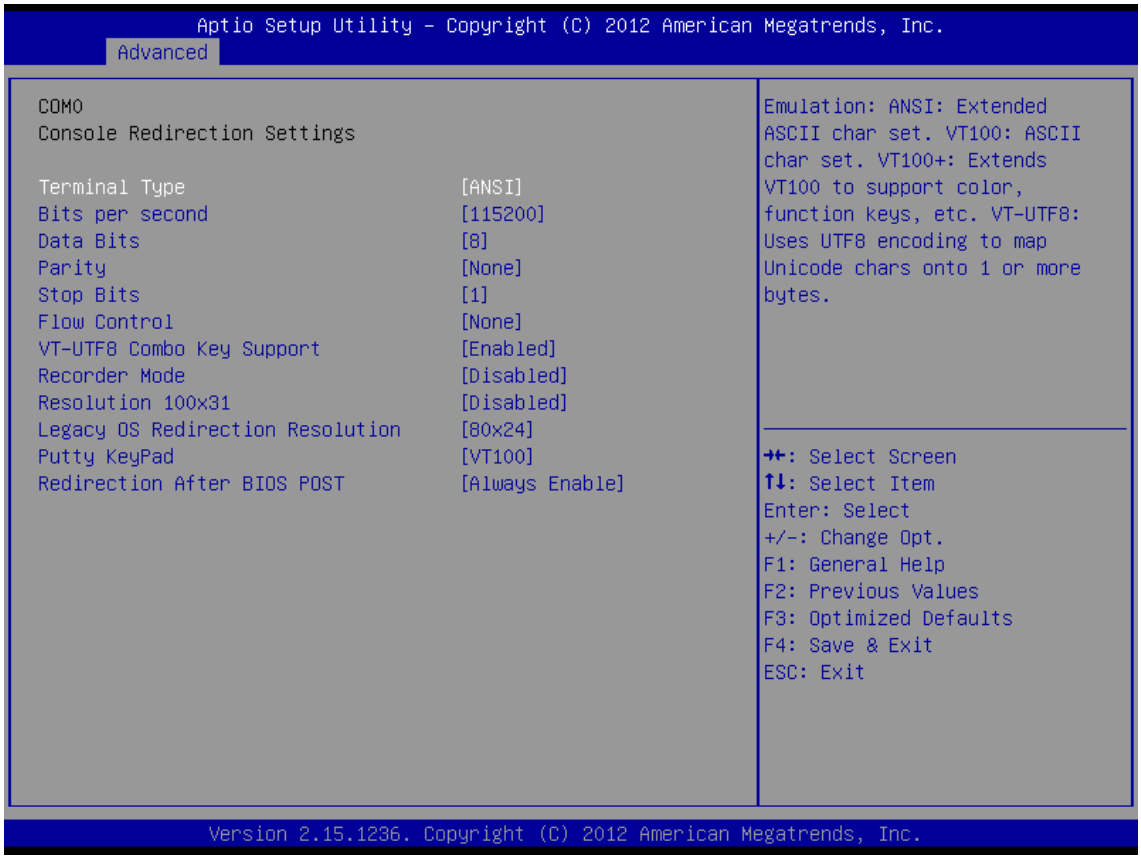
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Console Redirection

The BIOS Console Redirection feature is here. Set this value to **Enabled/Disabled.**

Console Redirection Settings

The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings. The screen is shown below.



Terminal Type

VT100+ is the preferred terminal type for out-of-band management. Configuration options are**: VT100, VT100+, VT-UTF8, ANSI.**

Bits per second

Select the bits per second you want the serial port to use for console redirection. The options are **115100, 57600, 38400, 19200**, **and 9600**.

Data Bits

Select the data bits you want the serial port to use for console redirection. Set this value to **7, 8**.

Parity

Set this option to select Parity for console redirection. The settings for this value are **None, Even, Odd, Mark, and Space.**

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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. Set this value to **1** and **2**.

Flow Control

Set this option to select Flow Control for console redirection.
The settings for this value are **None and Hardware RTS/CTS**.

VT-UTF8 Combo Key Support

Enable VT-UTF8 Combination Key support for ANSI/VT100 terminals.
The settings for this value are **Enabled and Disabled.**

Recorder Mode

When this mode is enabled, only text will be sent. This is to capture terminal data.
Set this value to **Enabled/Disabled.**

Resolution 100x31

Set this option to extended terminal resolution. Set this value to **Enabled/Disabled.**

Legacy OS Redirection

On Legacy OS, the number of rows and columns support redirection. Set this value to **80x24, 80x25**.

Putty KeyPad

Select function key and keypad on putty. Set this value to **VT100, LINUX, XTERMR6, SCO, ESCN, VT400**.

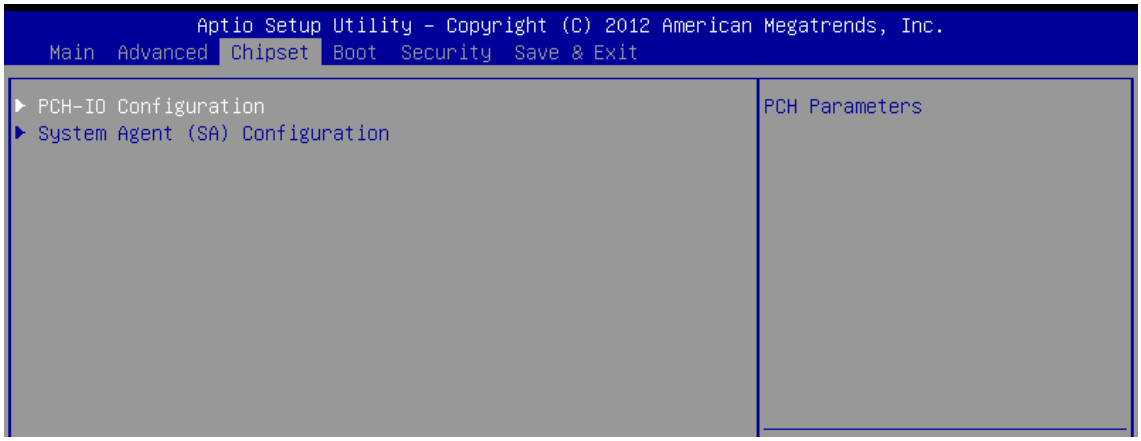
Redirection After BIOS POST

The settings specify if BootLoader is selected then legacy console redirection is disabled before booting to legacy OS. Default value is Always Enable which means legacy console redirection is enabled for legacy OS. Set this value to **Always Enable, BootLoader**.

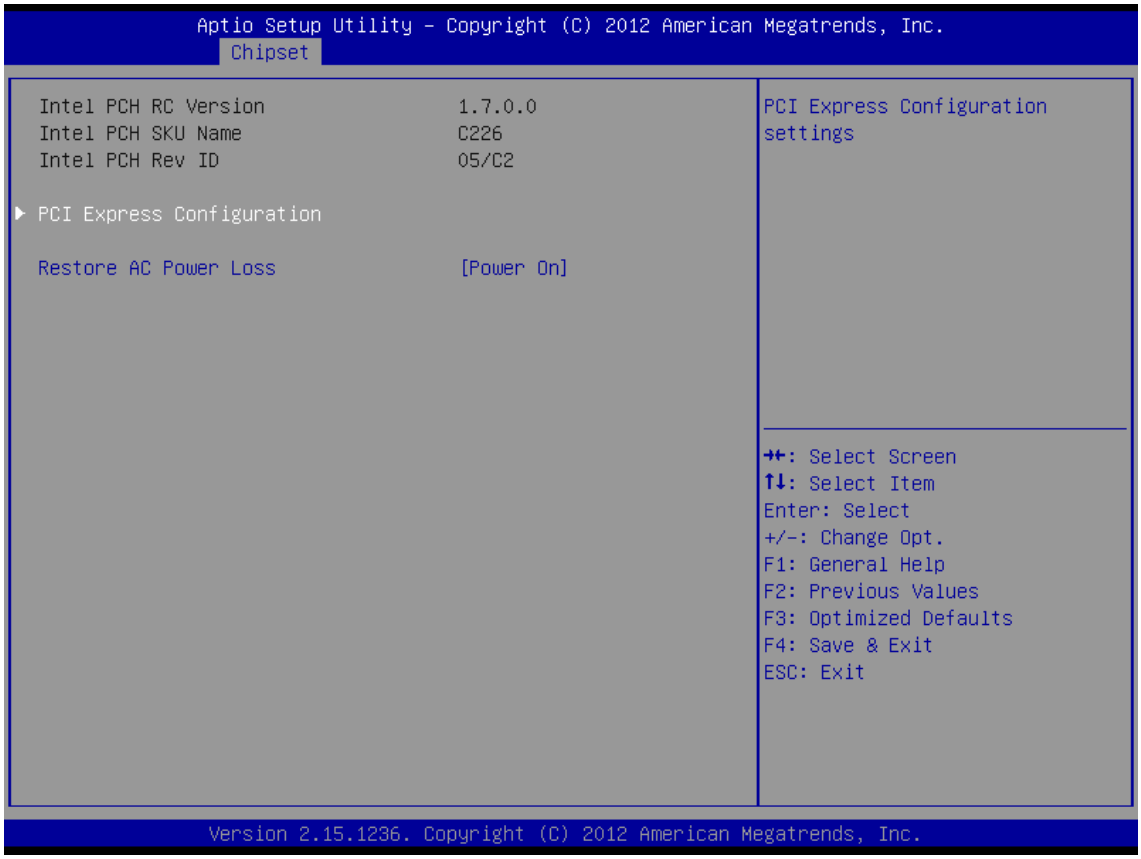
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7.6 Chipset Setup

Select the Chipset tab from the setup screen to enter the Chipset BIOS Setup screen. You can select any of Chipset BIOS Setup options by highlighting an option using the < Arrow > keys. The Chipset BIOS Setup screen is shown below.



7.6.1PCH-IO Configuration



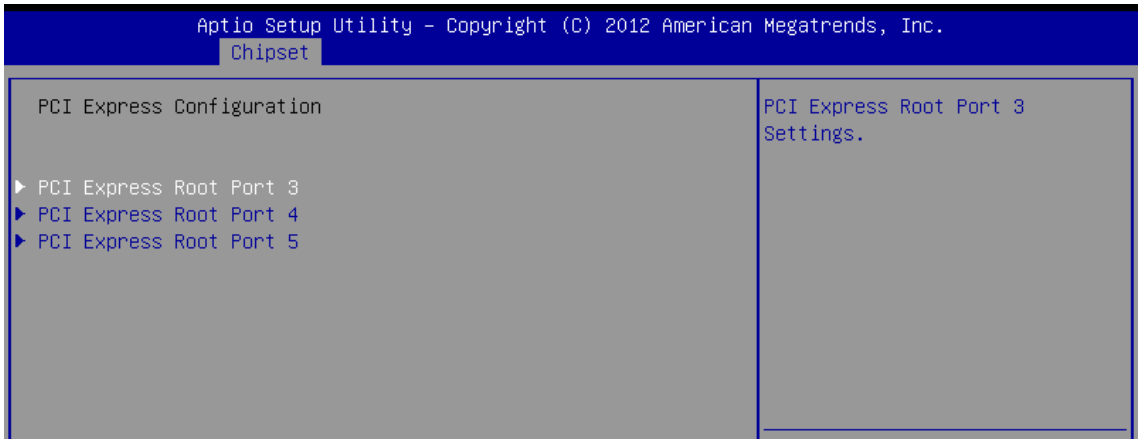
Restore AC Power Loss

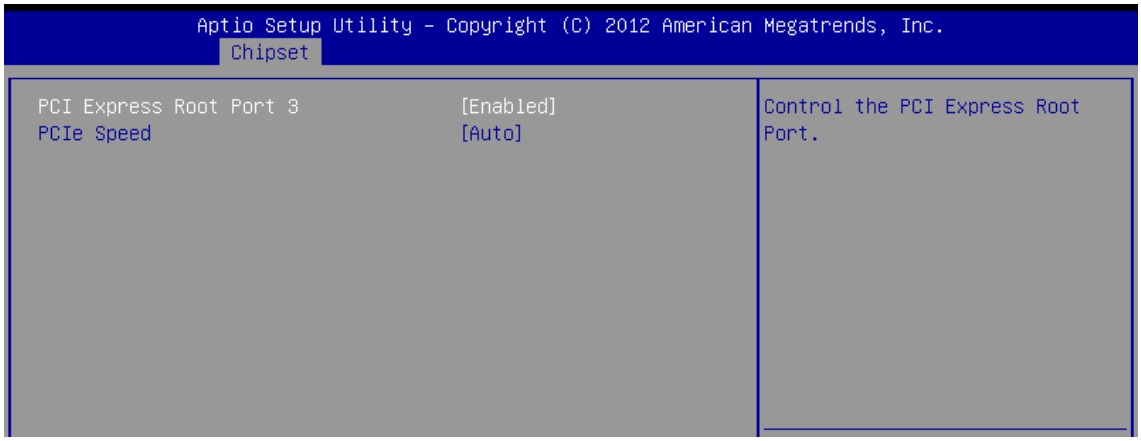
Select AC power state when power is re-applied after a power failure.

Set this value to **Power ON, Power Off, Last State**.

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7.6.1.1 PCI Express Configuration





PCI Express Root Port 3,4,5

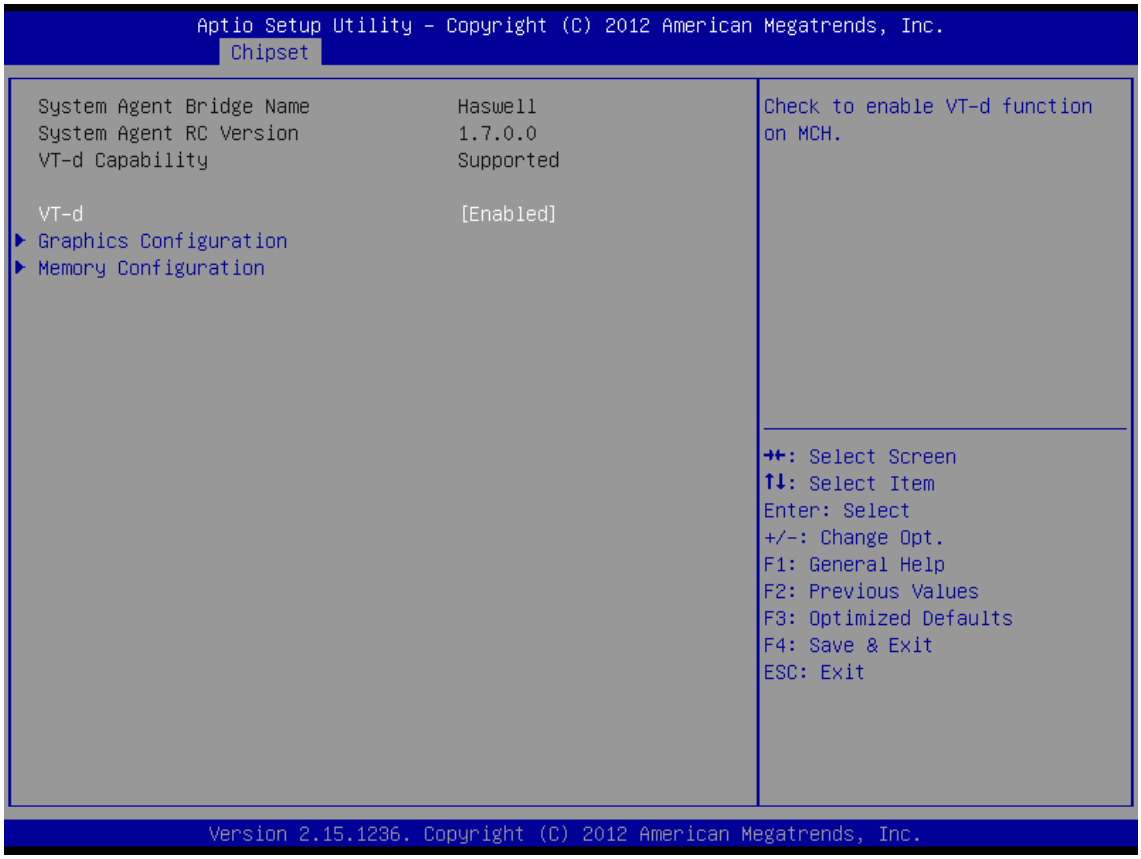
Control the PCI Express Root Port of 3-5. Set this value to **Enable / Disable.**

PCIe Speed

Select PCI Express port speed. Set this value to **Auto, Gen1, Gen2.**

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7.6.2 System Agent (SA) Configuration

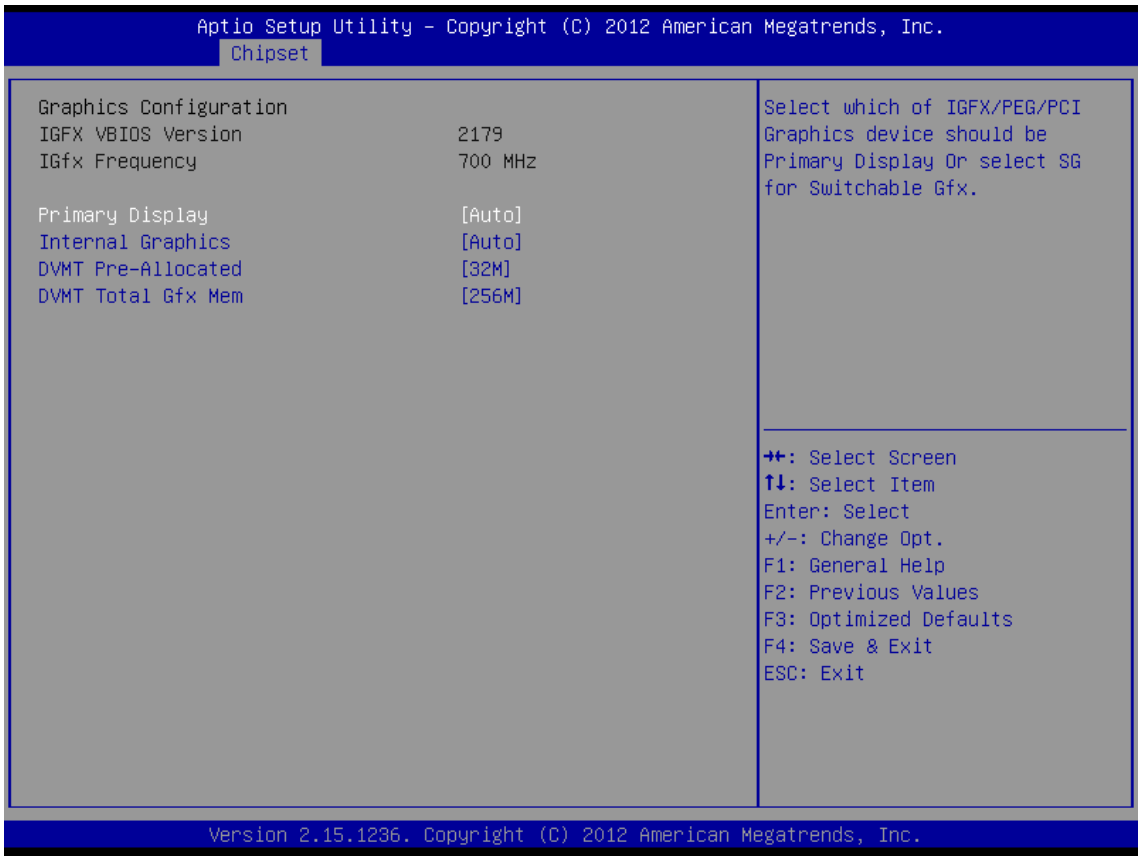


VT-d

The Intel Virtualization Technology for Directed I/O. Set this value to **Enabled/Disabled.**

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7.6.2.1 Graphics Configuration



Primary Display

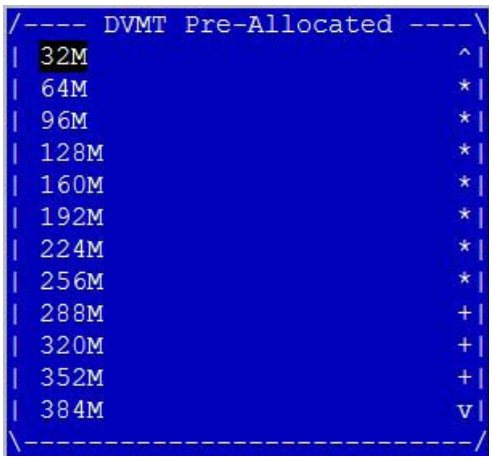
Select which of IGFX/PEG/ PCIE graphics device should be the primary display. Set this value to **Auto/ IGFX/ PCIE.**

Internal Graphics

Keep IGD enabled based on the setup options. Set this value to **Auto, Disabled, Enabled.**

DVMT Pre-Allocated

Select DVMT 5.0 Pre-Allocated (fixed) graphics memory size used by the internal graphics device. Configuration options are as seen on the below screen:



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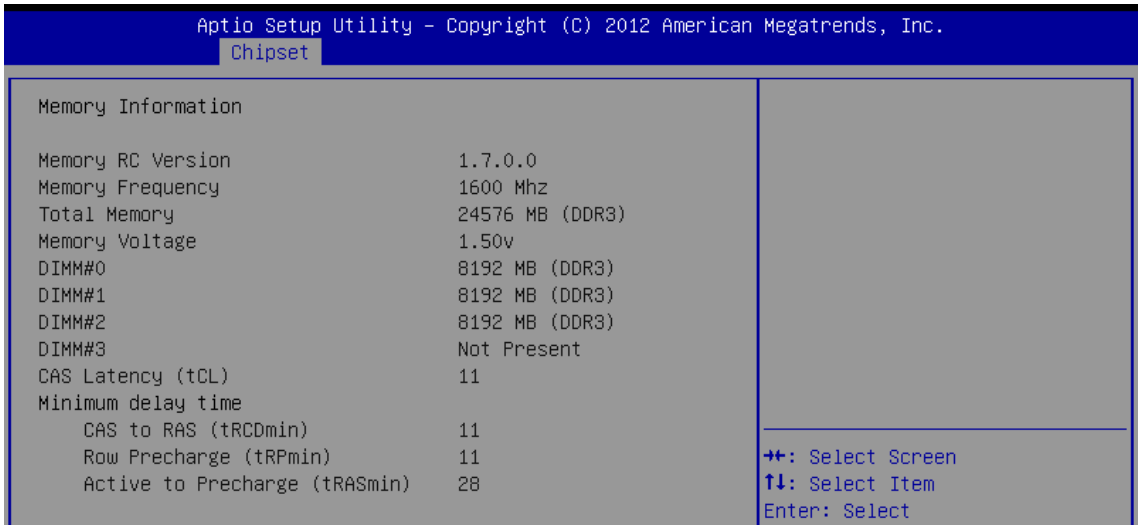
DVMT Total Gfx Memory

Select DVMT 5.0 total graphic memory size used by the internal graphics device. Configuration options are as seen on the below screen :



7.6.2.2 Memory Configuration

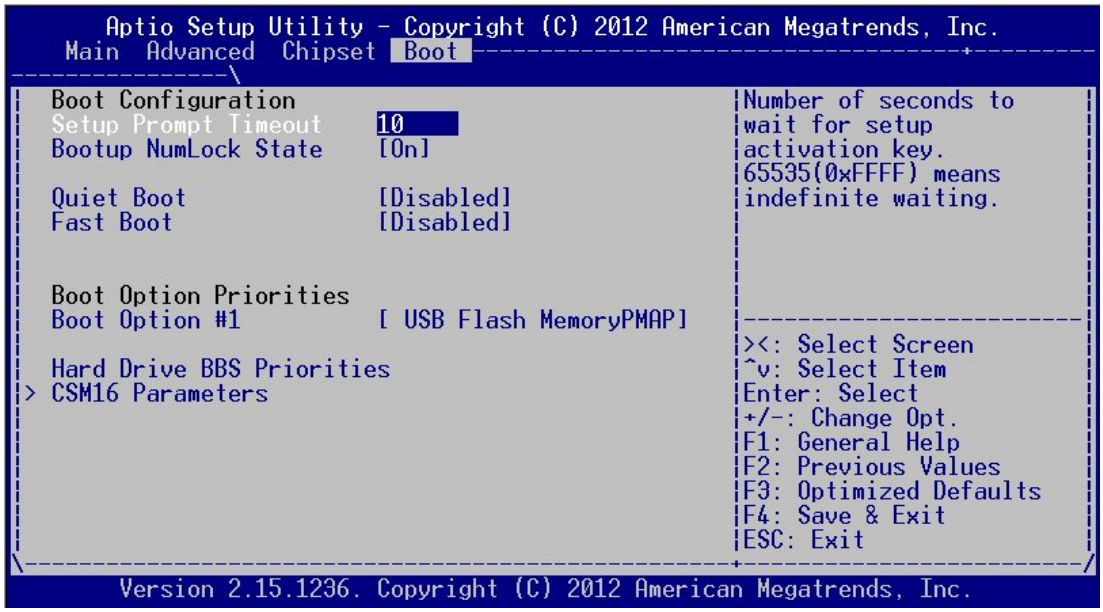
You can use this screen to check PC health status. The information will be described on the following pages.



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7.7 Boot Setup

Select the Boot tab from the setup screen to enter the Boot BIOS Setup screen. You can select any of the items in the left frame of the screen, such as Boot Device Priority, to go to the sub menu for that item. You can display a Boot BIOS Setup option by highlighting it using the < Arrow > keys. The Boot Settings screen is shown below:



Setup Prompt Timeout

Set the number of seconds that the system will wait for the setup activation key. The number of 65535(0xFFFF) means indefinite waiting.

Bootup NumLOck State

Select the keyboard NumLock state. Set this value to **On, Off.**

Quiet Boot

Disabled - Set this value to allow the computer system to display the POST messages.

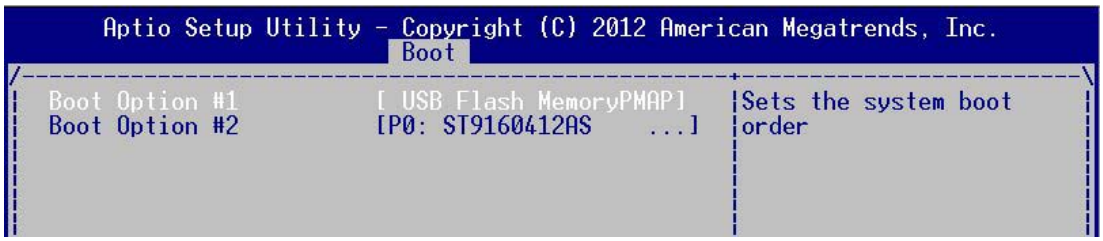
Enabled - Set this value to allow the computer system to display the OEM logo.

Fast Boot

Enables or disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options. Set this value to **Enable / Disable.**

Boot Option Priorities

Set Boot Option #1 -2 boot priority.



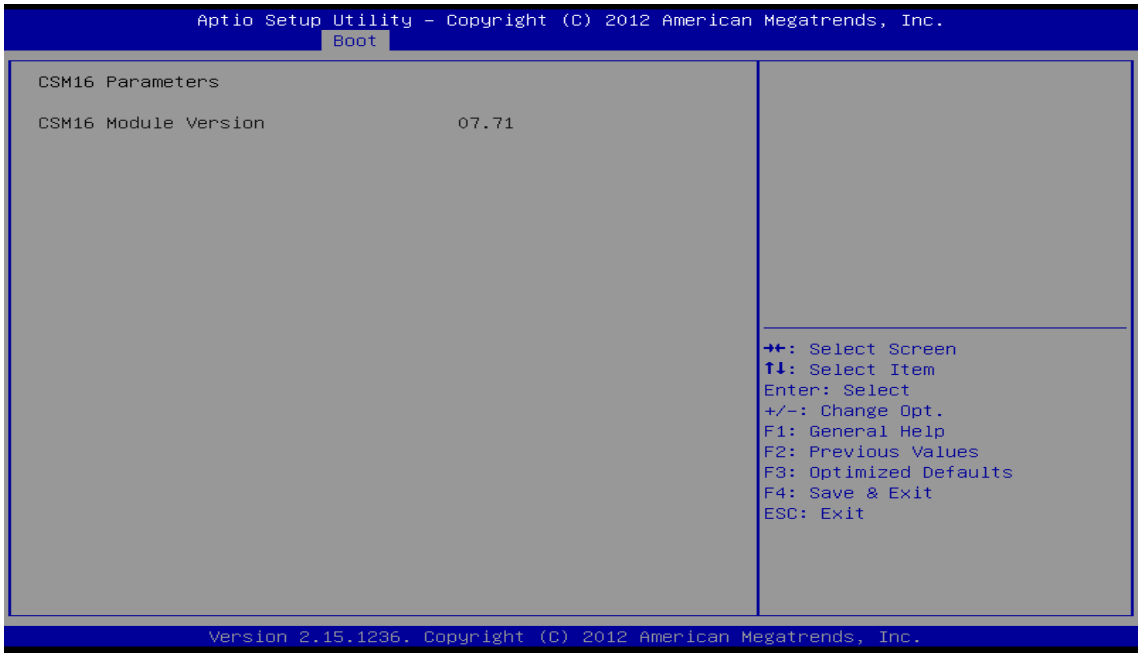
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Hard Drive BBS Priorities

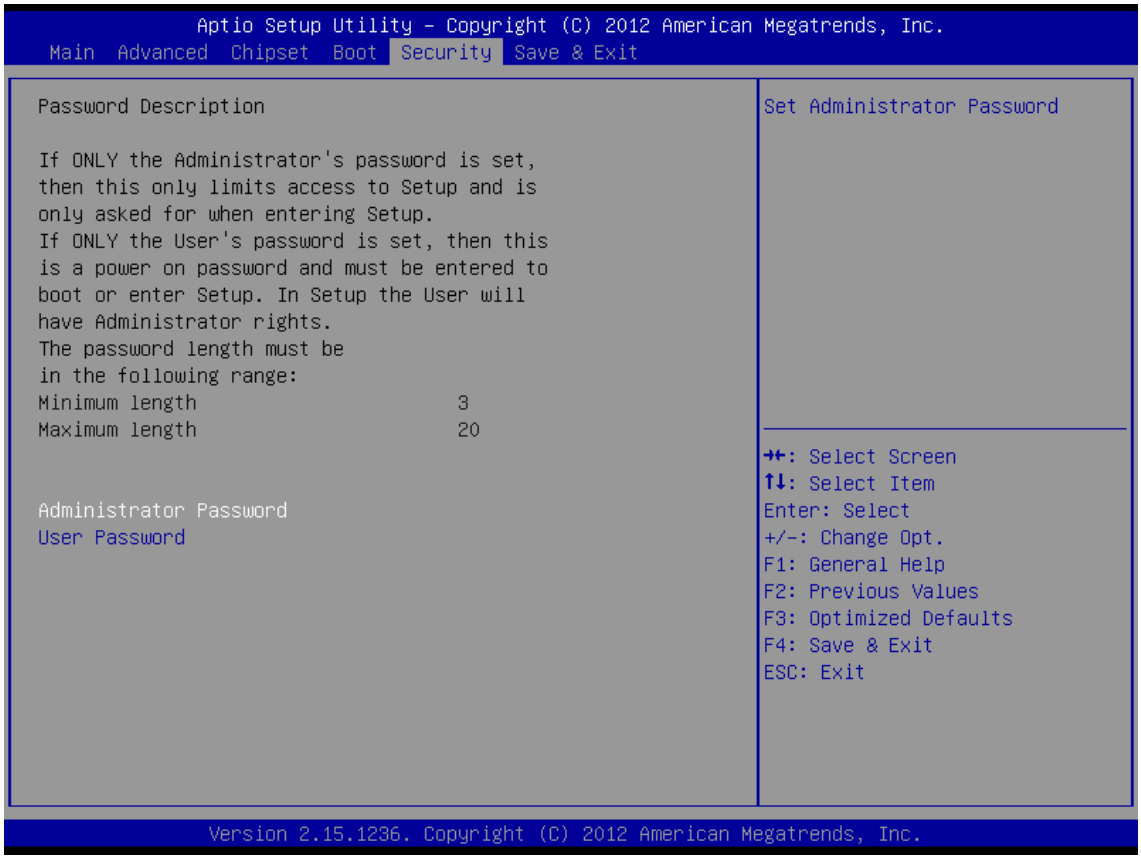
Specifies the boot device priority sequence from available hard drives.

CSM16 Parameters

You can use this screen to check CSM16 configuration. The information will be described on the following pages.



7.8 Security Setup



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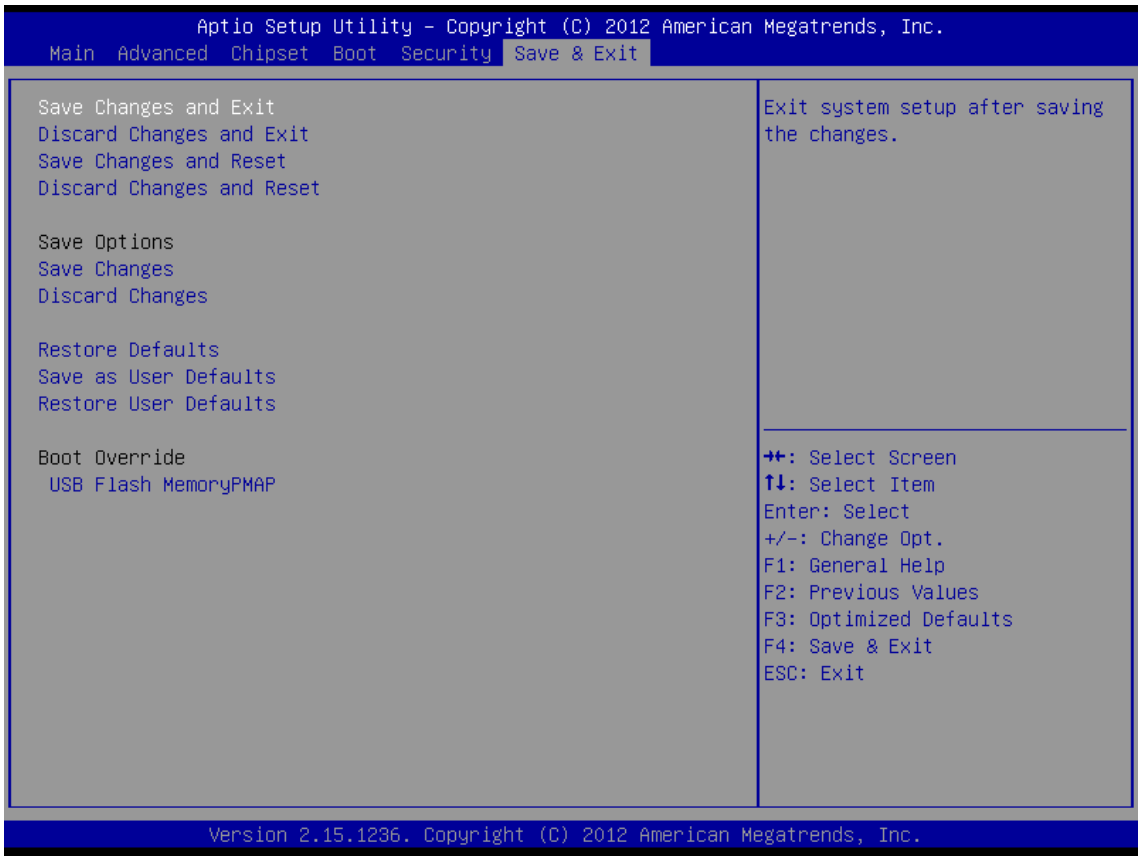
Administrator / User Password

If only the administrator's password is set, then this limits access to setup and is only asked for when entering setup.

If only the user's password is set, then this is a power on password and must be entered to boot or enter setup. In setup the user will have administrator rights.

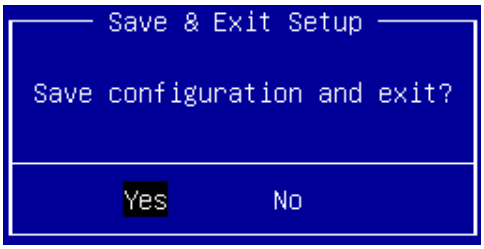
7.9 Save & Exit Menu

Select the *Exit* tab from the setup screen to enter the Exit BIOS Setup screen. You can display an Exit BIOS Setup option by highlighting it using the < Arrow > keys. The Exit BIOS Setup screen is shown below.



Save Changes and Exit

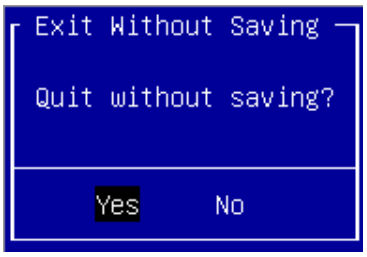
Exit system setup after saving the changes.



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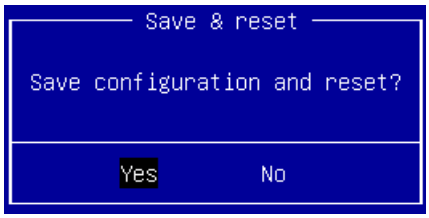
Discard Changes and Exit

Exit system setup without saving any changes.



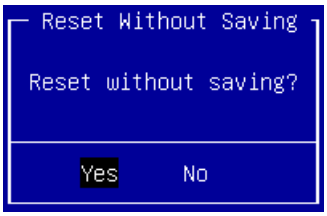
Save Changes and Reset

Reset the system after saving the changes.



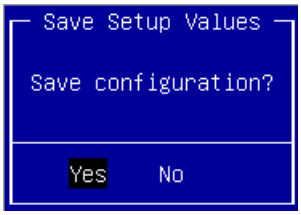
Discard Changes and Reset

Reset system setup without saving any changes.



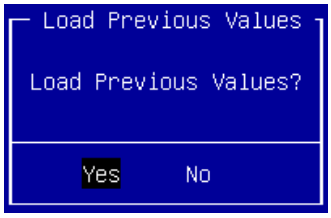
Save Changes

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



Discard Changes

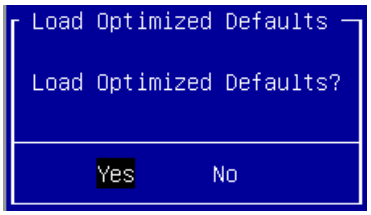
Discard Changes done so far to any of the setup options.



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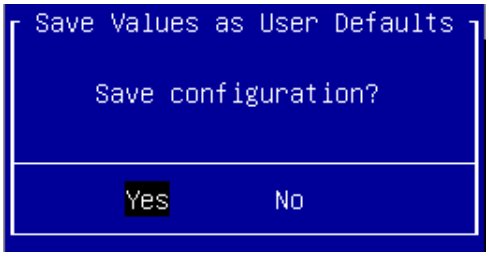
Restore Defaults

Restore/Load Defaults values for all the setup options.



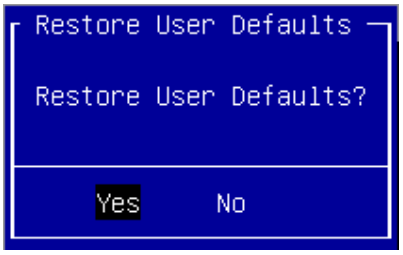
Save as User Defaults

Save the changes done so far as user defaults.



Restore User Defaults

Restore the user defaults to all the setup options.



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Safety Instructions

For user safety, please read and follow all **instructions**, **WARNINGS**, **CAUTIONS,** and **NOTES** marked in this manual and on the associated equipment before handling/operating the equipment.

1. Read these safety instructions carefully.
2. Keep this user's manual for future reference.
3. Read the specifications section of this manual for detailed information on the operating environment of this equipment.
4. The equipment can be operated at an ambient temperature of 40°C.
5. When installing/mounting or uninstalling/removing equipment; or when removal of the chassis lid required for user servicing (Section 3.1-3.5):
   - Turn off power and unplug any power cords/cables, and
   - Reinstall the chassis lid before restoring power.
6. To avoid electrical shock and/or damage to equipment:
   - Keep equipment away from water or liquid sources;
   - Keep equipment away from high heat or high humidity;
   - Keep equipment properly ventilated (do not block or cover ventilation openings);
   - Make sure to use recommended voltage and power source settings;
   - Always install and operate equipment near an easily accessible electrical socket-outlet;
   - Secure the power cord (do not place any object on/over the power cord);
   - Only install/attach and operate equipment on stable surfaces and/or recommended mountings;
   - If the equipment will not be used for long periods of time, turn off and unplug the equipment from its power source.
7. Never attempt to fix the equipment. Equipment should only be serviced by qualified personnel.
8. A Lithium-type battery may be provided for uninterrupted, backup or emergency power. **CAUTION! Risk of explosion if battery is replaced with one of an incorrect type. Please dispose of used batteries appropriately.**
9. Equipment must be serviced by authorized technicians when:
   - The power cord or plug is damaged;
   - Liquid has penetrated the equipment;
   - It has been exposed to high humidity/moisture;
   - It is not functioning or does not function according to the user's manual;
   - It has been dropped and/or damaged; and/or,
   - It has an obvious sign of breakage.
10. Please pay strict attention to all warnings and advisories appearing on the device, to avoid injury or damage.

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Consignes de Sécurité Importantes

Pour assurer la sécurité de l'utilisateur, veuillez lire et suivre toutes les **directives**, ainsi que les **AVERTISSEMENTS**, **MISES EN GARDE** et **REMARQUES** de ce manuel et indiqués sur l'équipement associé avant de manipuler ou utiliser l'équipement.

1. Veuillez lire attentivement ces instructions de sécurité avec soin.
2. Veuillez conserver ce manuel pour référence future.
3. Veuillez lire la section des spécifications de ce manuel pour avoir des informations détaillées sur l'environnement d'exploitation de cet équipement.
4. L'équipement peut être utilisé à une température ambiante de 40°C.
5. Lors de l'installation ou du montage et de la désinstallation ou de la dépose de l'équipement; ou lors de la dépose du couvercle du châssis pour procéder à l'entretien par l'utilisateur (Sections 3.1-3.5):
   - Coupez l'alimentation et débranchez les cordons et les câbles d'alimentation, et
   - Reposez le couvercle du châssis avant de remettre l'alimentation.
6. Pour éviter un risque d'électrocution et pour éviter d'endommager l'équipement :
   - Éloignez l'équipement de l'eau et de toute source liquide;
   - Éloignez l'équipement de toute source de chaleur ou d'humidité élevée;
   - Gardez l'équipement correctement ventilé (ne pas bloquer ou couvrir les ouvertures de ventilation);
   - Veillez à utiliser la tension recommandée et les réglages adéquats pour la source d'alimentation;
   - Veuillez toujours installer et exploiter l'équipement à proximité d'une prise de courant facilement accessible;
   - Assurez-vous que le cordon d'alimentation est acheminé de manière sécuritaire (ne déposez aucun objet dessus);
   - Installez, fixez et utilisez l'équipement sur des surfaces stables ou sur les fixations recommandées uniquement;
   - Si l'équipement n'est pas utilisé pendant une longue période, éteignez-le et débranchez-le de sa source d'alimentation.
7. N'essayez jamais de réparer l'équipement. L'équipement ne doit être réparé que par du personnel qualifié.
8. Une pile au lithium peut être installée pour assurer l'alimentation de secours ou d'urgence en continu.
   ATTENTION! Risque d'explosion si la pile est remplacée par une autre de type incorrect. Veuillez jeter les piles usagées de façon appropriée.
9. L'équipement doit être entretenu par des techniciens agréés lorsque :
   - le cordon d'alimentation est endommagé ou lorsque la fiche électrique est endommagée;
   - du liquide a pénétré à l'intérieur de l'équipement;
   - l'équipement a été exposé à un taux d'humidité élevé;
   - l'équipement ne fonctionne pas ou ne fonctionne pas conformément au manuel de l'utilisateur;
   - l'équipement est tombé ou lorsqu'il a été endommagé;
   - l'équipement présente un signe évident de défaillance.
10. Veuillez porter une attention rigoureuse à tous les avertissements et à tous les avis figurant sur l'appareil, pour éviter des blessures ou des dommages.

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Getting Service

Contact us should you require any service or assistance.

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