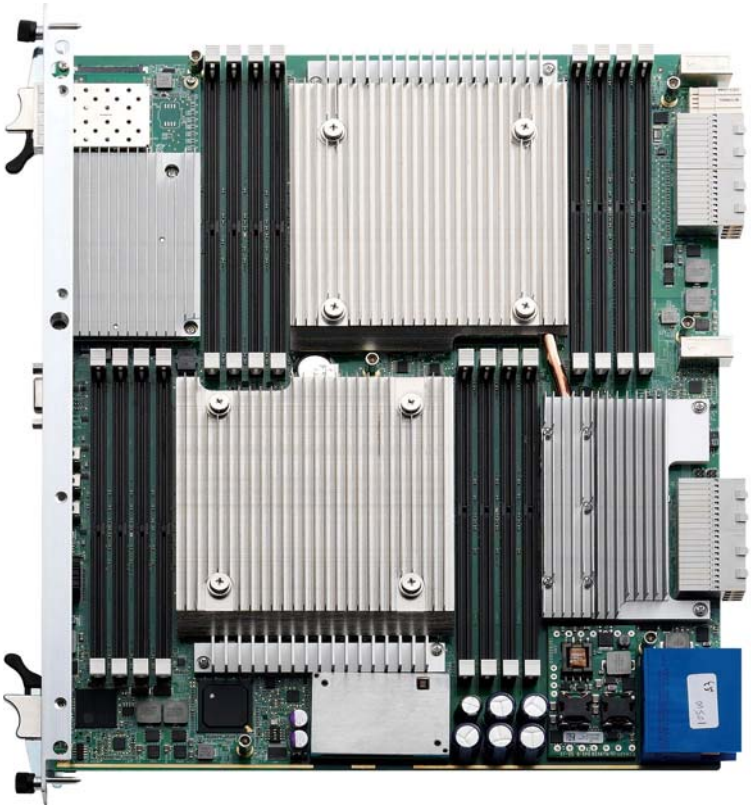
aTCA-9710

Dual Intel Xeon E5-2658 v3
40G AdvancedTCA Processor Blade

User's Manual



Manual Revision: 1.0
Revision Date: June 6, 2018
Part No.: 50-1G040-1000

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Leading EDGE COMPUTING

Preface

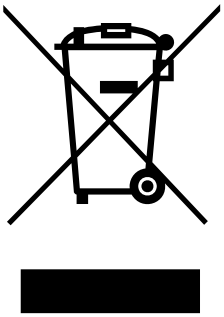
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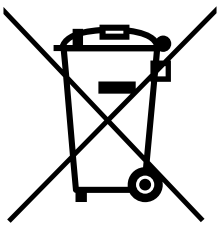
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Revision History

Revision	Release Date	Description of Change(s)
1.0	6/6/2018	Initial release

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1 Overview

1.1 Introduction

The ADLINK aTCA-9710 is a high performance AdvancedTCA® (ATCA) processor blade featuring dual 12-core Intel® Xeon® Processor E5-2658 v3, Intel® C612 Chipset, eight-channel memory up to 256GB of DDR4 memory and 400W power supply subsystem. Versatile connectivity includes four 40GbE Fabric Interfaces, dual GbE Base Interfaces, dual front panel 10GbE egress ports, front panel dual COM and USB 2.0 ports and front panel VGA connector. An onboard SATA connector supports a mSATA up to 256GB and the optional RTM (aTCA-R9700) supports six 10GbE SFP+ ports and one hot-swappable SATA bay providing additional network throughput and storage capacities.

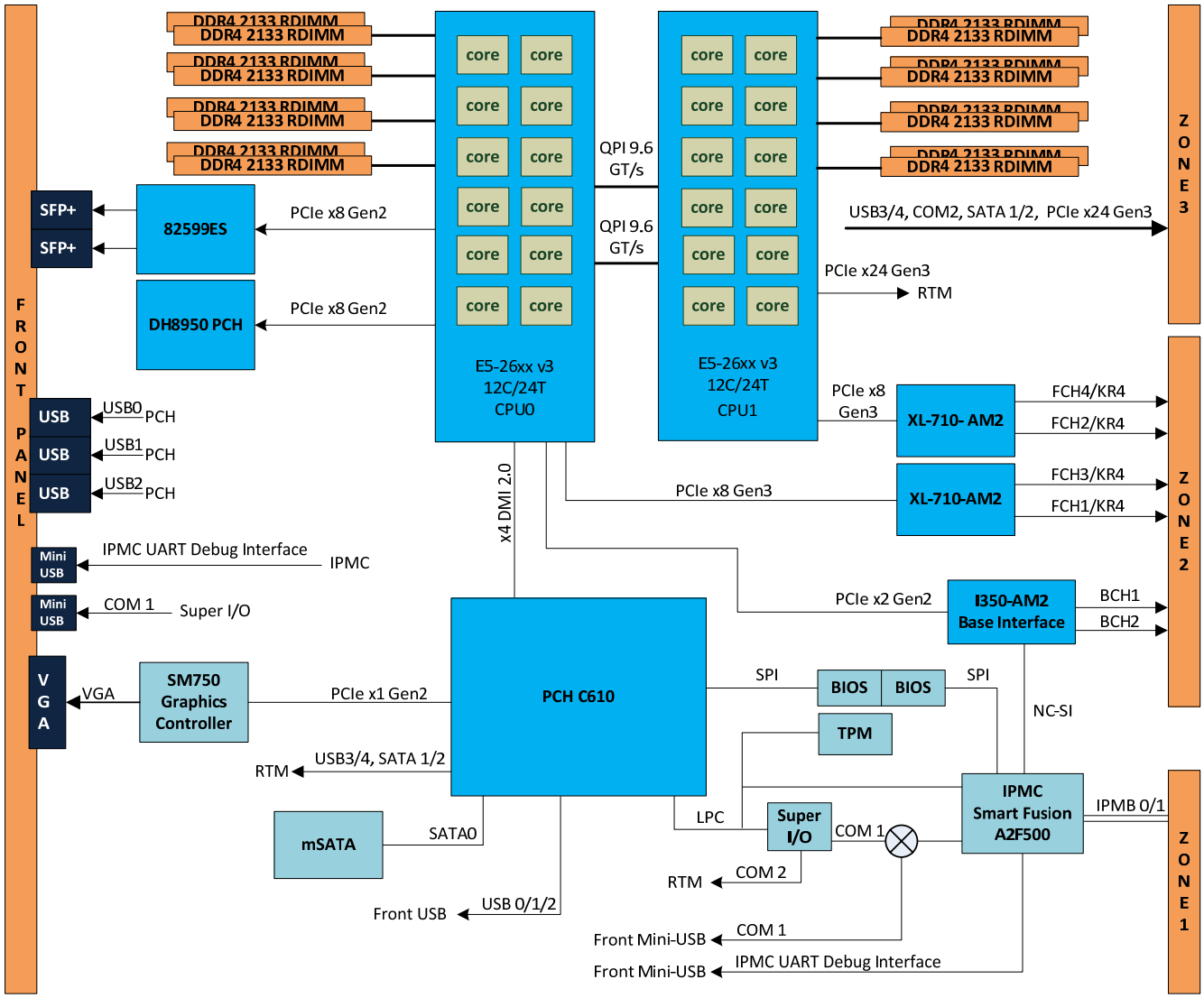
The aTCA-9710's thermal solution (including VRM heat sink) ensures stable operation under extreme operating environments and allows for compliance to the NEBS Level 3 standard (design only). The robust computing power and reliability of the aTCA-9710 meets the requirements of telecom equipment manufacturers (TEMs) and network equipment providers (NEPs), allowing them to build the next-generation telecom networks and communication infrastructures.

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

- Two 12-core Intel® Xeon® processor E5-2658 v3
- Server-class Intel® C612 Chipset
- DDR4-2133 JEDEC standard VLP RDIMM (REG/ECC), up to 256 GB
- Onboard bootable 32GB mSATA module (max. 256GB)
- One Intel® I350 AM2 dual-port PCI Express Gigabit Ethernet controller
- Two Intel® XL-710-AM2 dual-port PCI Express 40Gigabit Ethernet controllers
- One Intel 82599ES 10Gigabit Ethernet Controller to front panel via SFP+ ports
- Optional three Intel® 82599ES 10Gigabit Ethernet Controllers (6 SFP+ ports) on RTM (aTCA-R9700)
- Optional SATA 6G interface drive bay on RTM (aTCA-R9700)
- PICMG 3.1 Option 9-KR four Fabric Interface channels supporting dual dual-star
- Failover system BIOS
- Analog VGA output up to 1920x1440 resolution

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1.2 Block Diagram



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1.3 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:

- aTCA-9710 AdvancedTCA processor blade (CPU, RAM specifications may differ depending on options selected)
- USB Mini-B to DB-9 cable (for front panel serial port)

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2 Specifications

2.1 aTCA-9710 Specifications

2.1.1 CPU/ Chipset/ Memory

CPU	Dual 12-core Intel® Xeon® Processor E5-2658 v3, (2.2/2.9GHz QPI 9.6GT/s, 30MB L2 cache, LGA2011 Socket)
Chipset	Intel® C612 Chipset
Memory	Registered ECC DDR4-1600/1866/2133 VLP RDIMM 16x RDIMM sockets Up to 256GB

2.1.2 Standard and Interface

Standards	PICMG 3.0 R3.0 AdvancedTCA PICMG 3.1 AdvancedTCA Ethernet, Option 9-KR
Networking	1x dual-port Intel® I350 AM2 Gigabit Ethernet Controller 1x dual-port Intel® 82599ES 10Gigabit Ethernet Controller 2x 10GbE SFP+ ports on face plate 2x 10/100/1000BASE-T Base Interface channels 4x 10GBASE-KR4 Fabric Interface channels via two XL-710-AM2 40G Ethernet Controllers (Option 9-KR) 6x 10GBASE SFP+ ports on RTM (aTCA-R9700)
Display	Silicon Motion SM750 graphics controller Front panel analog VGA connector supports up to 1920x1440 resolution
USB	2x USB 2.0 ports on front panel, two USB 2.0 ports to RTM
Serial	1x IPMC serial debug port (USB Mini-B) 1x RS-232 ports on front panel (USB Mini-B) 1x RS-232 port to RTM
Storage	Onboard mSATA module 32GB, up to 256GB 2x SATA channels to RTM
Front Panel I/O	1x VGA port (DB-15) 3x USB 3.0 port (Type-A) 1x IPMC serial debug port (USB Mini-B connector) 1x RS-232 port (USB Mini-B connector) 2x 10GbE ports (SFP+) LEDs: OOS, BIOS/OS boot OK, IPMC payload power authorization and IPMC chassis identify command Recessed reset button
Rear I/O (aTCA-R9700)	6x SFP+ ports (three Intel® 82599ES 10G Ethernet Controllers) 1x SATA port from Intel® C612 PCH

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2.1.3 Software

BIOS	AMI BIOS with 8Mbit flash memory
Supported OS	Microsoft Windows Server 2012 R2 Red Hat Enterprise Linux 6.x/7.0 Contact ADLINK for other OS availability

2.1.4 Mechanical & Environmental

Dimensions	322.25mm x 280mm x 30.48mm (H x D x W) - 6HP slot
Operating Temperature	Standard: 0°C to 55°C NEBS short-term: 0°C to 61°C (sea level)
Storage Temperature	-40°C to 85°C
Humidity	5% to 90% non-condensing
Shock	15G peak-to-peak, 11ms duration, non-operation
Vibration	Non-operating: 1.88 Grms, 5 to 500 Hz, each axis Operating: 0.5 Grms, 5 to 500Hz, each axis
Compliance	CE, FCC Class A, UL, NEBS Level 3 (design)

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2.2 Power Consumption

This section provides information on the power consumption of the aTCA-9710.

System configuration

(1) Memory: 16x 8GB DDR4-2133 ECC REG
(2) Graphics: Silicon Motion SM750
(3) Power Supply: Chroma DC Power supply 62012P-80-60
(4) CPU: 2x 12-core Intel® Xeon® processor E5-2658 v3

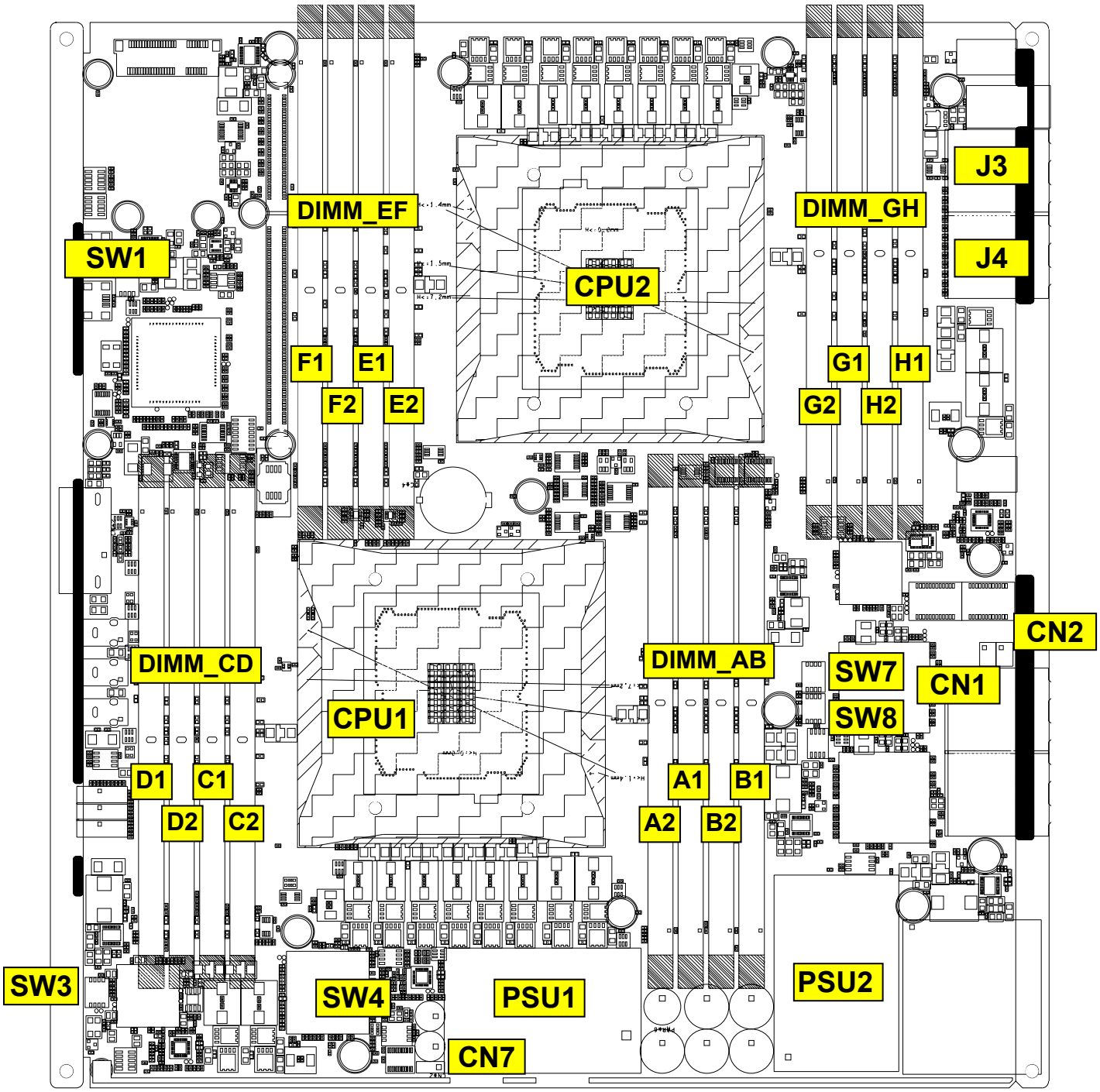
The following table lists power consumption under different operating systems and applications with a 48V power rail.

OS and Application	Power Consumption
Windows Server 2008 R2, idle	81.12 W
Windows Server 2008 R2, BurnIn Test, CPU 100% usage	316.32 W
Windows Server 2008 R2, Power Thermal Utility, CPU 100% Usage	365.76 W

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2.3 Board Layout

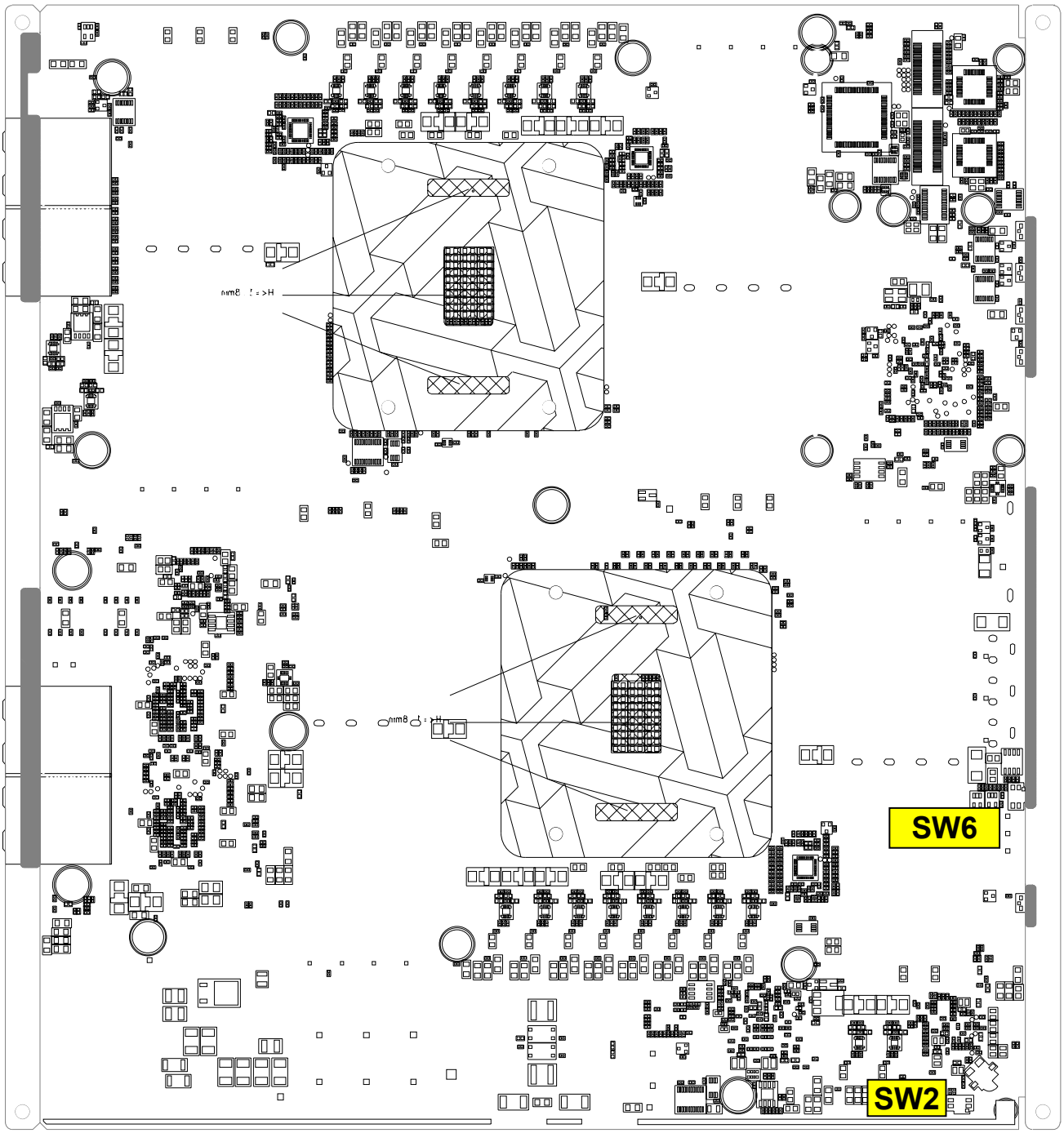
2.3.1 aTCA-9710 Board Layout - Component Side



Location	Description	Location	Description
CN1	XL710 JTAG debug header	**SW1**	Reserved for PCH debug
CN2	XL710 JTAG debug header	**SW2**	Clear CMOS
CN7	Ground connection	**SW3**	IPMC Programming mode
DIMM_AB/CD	DDR4 DIMM A-D	**SW4**	IPMC Mode Select
DIMM_EF/GH	DDR4 DIMM E-H	**SW6**	HW Reset Button
J3/4	Zone 3 to RTM	**SW7**	Reserved for XL710 debug
PSU1	400W -48V DC/DC module	**SW8**	Reserved for XL710 debug
PSU2	400W Hot Swap Power Module		

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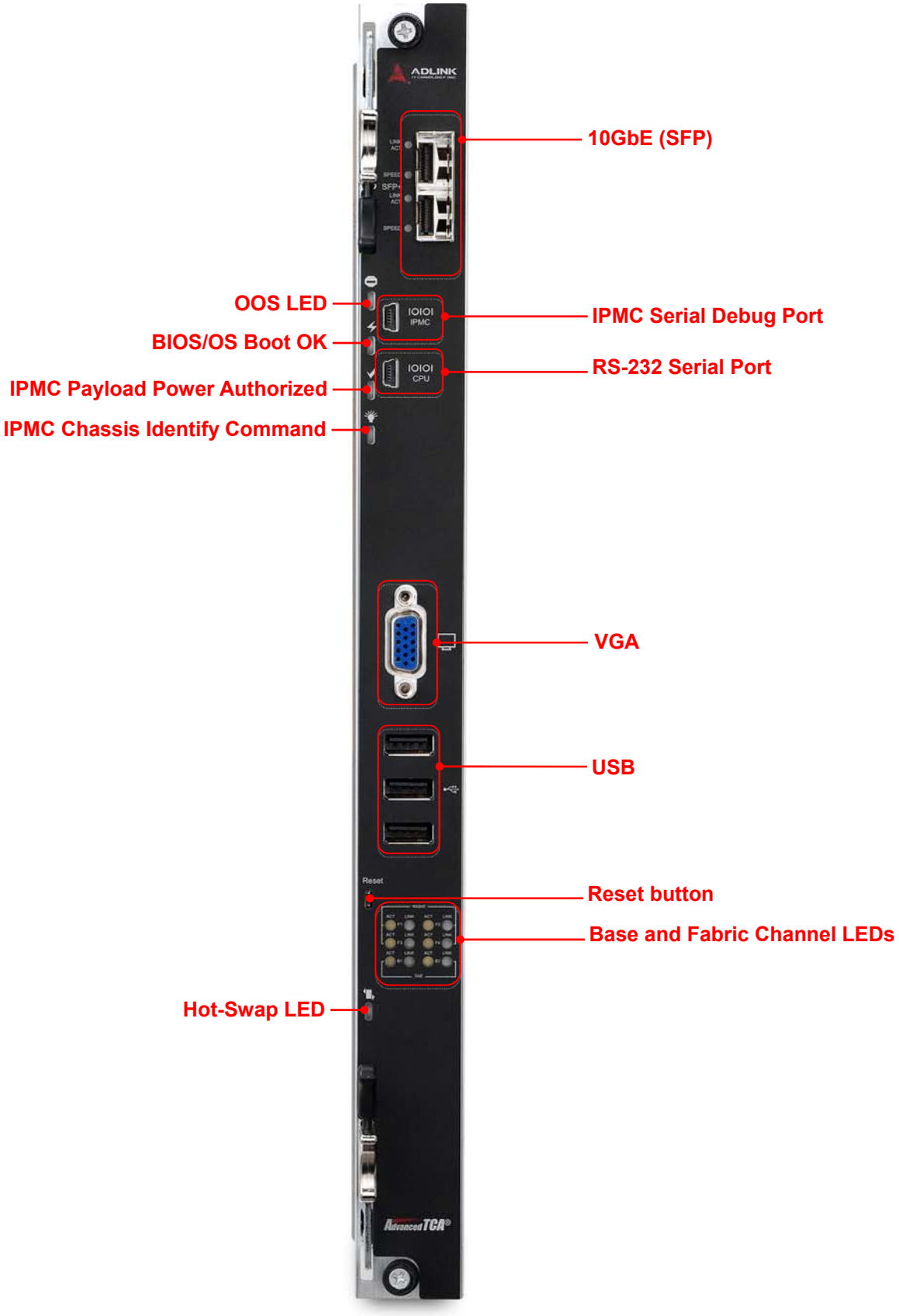
2.3.2 aTCA-9710 Board Layout - Solder Side



Location	Description
SW2	Clear CMOS
SW6	HW Reset Button

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2.3.3 aTCA-9710 Front Panel



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2.3.4 Status LED Definitions

The following sections describe the front panel Status LEDs: Hot-swap LED, OOS LED, BIOS/OS Boot OK LED, IPMC Payload Power Authorized LED and IPMC Chassis Identify Command LED.

2.3.4.1 Out of Service (OOS) LED



Out of Service LED (Red)	State	Remark
Blinking	During BIOS POST	M4
Off	BIOS POST OK	M4
On	After OS shutdown	M1

2.3.4.2 BIOS/OS Boot OK



BIOS/OS Boot OK (Green)	State	Remark
Blinking	During OS Boot	
Off	During BIOS POST	
On	OS Boot OK	

2.3.4.3 IPMC Payload Power Authorized



IPMC Payload Power Authorized (Amber)	State	Remark
On	Payload Power Authorized	
Off	Payload Power Not Authorized	

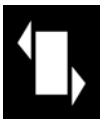
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2.3.4.4 IPMC Chassis Identify Command LED



IPMC Chassis Identify Command (Amber)	State	Remark
Off	Default Off	
Blinking	Chassis Identify Command Active	

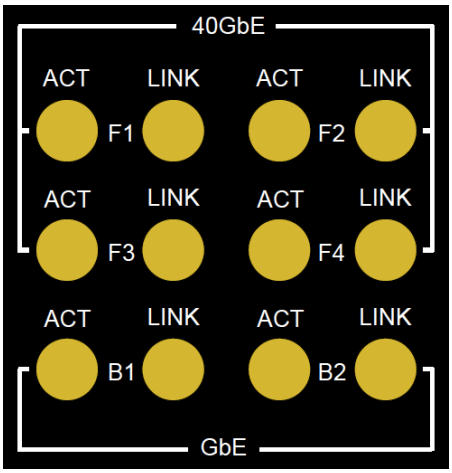
2.3.4.5 Hot-swap LED



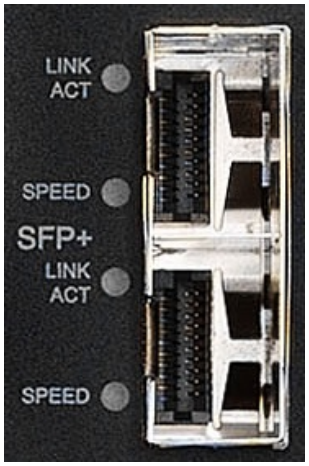
Hot-swap LED (Blue)	FRU State number	FRU State Name
Off	M0	FRU not installed
On	M1	FRU inactive
Long blink	M2	FRU activation request
Off	M3	FRU activation in process
Off	M4	FRU active
Short blink	M5	FRU deactivation request
Short blink	M6	FRU deactivation in process

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2.3.4.6 Base and Fabric Channels LEDs

Base and Fabric Channels LEDs			
FCH1 ACT **(Amber)** Blink when accessing Ethernet I/O	**Fabric 1** Link **(Amber)** 40Gbps – ON	**FCH 2** ACT **(Amber)** Blink when accessing Ethernet I/O	**Fabric 2** Link **(Amber)** 40Gbps – ON
FCH 3 ACT **(Amber)** Blink when accessing Ethernet I/O	**Fabric 3** Link **(Amber)** 40Gbps – ON	**FCH 4** ACT **(Amber)** Blink when accessing Ethernet I/O	**Fabric 4** Link **(Amber)** 40Gbps – ON
			
BCH1 ACT **(Amber)** Blink when accessing Ethernet I/O	**BCH1** Speed and Link 100 Mbps: **Green** 1Gbps: **Amber**	**BCH2** ACT **(Amber)** Blink when accessing Ethernet I/O	**BCH2** Speed and Link 100 Mbps: **Green** 1Gbps: **Amber**

2.3.4.7 Front Panel 10GbE SFP+ LEDs



Left LED: Speed and Link
1Gbps: **Amber**,
100Mbps: **Green**

Right LED: ACT
Blinking while data exchanging
Color: **Amber**

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2.4 Compliance

The aTCA-9710 conforms to the following specifications:

- PICMG 3.0 R2.0 ECN0002 AdvancedTCA
- PICMG 3.1 Ethernet over AdvancedTCA Option 9-KR
- NEBS Level 3 (design)

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3 Functional Description

3.1 CPU, Memory and Chipset

3.1.1 CPU

The Intel® Xeon® processor E5-2658 v3 implements several key technologies:

- Four channel Integrated Memory Controller supporting DDR4
- Integrated I/O with up to 40 lanes for PCI Express Generation 3.0
- Two point-to-point link interface based on Intel® QuickPath Interconnect (Intel® QPI) up to 9.6GT/s
- 30 MB of shared cache

The Intel® Xeon® processor E5-2658 v3 supports several advanced technologies:

- Intel® 64 Technology
- Enhanced Intel® SpeedStep® Technology
- Intel® Virtualization Technology (Intel® VT)
- Intel® Hyper-Threading Technology (Intel® HT Technology)

The Intel® Xeon® processor E5-2658 v3 has a maximum TDP of 105W and has an elevated case temperature specification. The elevated case temperatures are intended to meet the short-term thermal profile requirements of NEBS Level 3. The Intel® Xeon® processor E5-2658 v3 is ideal for thermally constrained form factors in embedded servers, communications and storage markets.

Supported Processors, Maximum Power Dissipation

The following table describes the Intel® Xeon® processor E5 family CPUs supported by the aTCA-9710:

Name	E5-2658 v3
L2 cache	30MB
Clock	2.2GHz
QPI	9.6 GT/s
TDP	105W

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3.1.2 Memory

The aTCA-9710 is a dual processor system with each Intel® Xeon® processor E5 2600 v3 series providing four memory channels supporting DDR4, 1600, 1866, 2133 MT/s DIMMs. The maximum memory capacity is 256GB with memory interleaving support. The 400/533/667/800/933 MHz differential memory clocks are driven by the Intel® Xeon® processor E5-2658 v3 CPU with length-matching and impedance controlled through all the DIMM slots.

The DDR4 DIMMs support the I^2C interface. They are connected together and routed to the PCH for the management.



Memory configuration changes are only permitted to be performed at the factory. Failure to comply with the above may result in damage to your board or improper operation.

3.1.3 Intel® C612 Chipset Overview

The Intel® C612 Chipset provides a connection point between various I/O components and DMI based processors. Functions and capabilities include:

- PCI Express Base Specification, Revision 2.0 support for up to eight ports with transfers up to 5 GT/s.
-
- ACPI Power Management Logic Support, Revision 4.0a Enhanced DMA controller, interrupt controller, and timer functions
- Integrated Serial ATA host controller switch independent DMA operation on up to 10 ports.
- USB host interface with two EHCI high-speed USB 2.0 Host controllers and 2 rate matching hubs provide support for support for up to fourteen USB 2.0 ports
- Integrated 10/100/1000 Gigabit Ethernet MAC with System Defense
- System Management Bus (SMBus) Specification, version 2.0 with additional support for I2C devices
- Intel® High Definition Audio Supports
- Intel® Rapid Storage Technology enterprise (Intel® RSTe)
- Intel® Active Management Technology (Intel® AMT)
- Intel® Virtualization Technology for Directed I/O (Intel® VT-d)
- Intel® Trusted Execution Technology (Intel® TXT)
- Low Pin Count (LPC) interface Firmware Hub (FWH) interface
- Serial Peripheral Interface (SPI)
- Intel® Anti-Theft Technology (Intel® AT)
- JTAG Boundary Scan support

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3.1.4 Silicon Motion SM750 Graphics Controller

The aTCA-9710 provides an analog VGA port on the front panel powered by a Silicon Motion SM750 2D graphics controller with the following features:

- PCI-Express x1 architecture
- 16MB integrated video DDR memory
- Low power consumption < 1.5W
- 300 MHz DAC supports up to 1920x1440 resolution
- 128-bit 2D graphic engine
- ROPs, BitBLT, transparent BLT, pattern BLT, Color expansion, and Line drawing
- YUV-16/32-bit RGB conversion
- Support 7 layers of display frames (2 hardware cursors, primary graphic, video, video alpha, alpha, and secondary graphic)
- Two 8-bit portsorone16-bitvideocaptureportsupportsITU601
- and ITU 656 specifications UV-16/32-bit RGB conversion
- ReduceOn Power Management Technology
- Quick-Rotation features allow for 90°, 180°, and 270° rotation of on-screen images

3.2 Peripherals

The following peripherals are available on the aTCA-9710 blade

3.2.1 Reset

The aTCA-9710 is automatically reset by a precision voltage monitoring circuit that detects a drop in voltage below the acceptable operating limit of 4.85V for the 5V line and below 3.2V for the 3.3V line. Other reset sources include the Watchdog Timer, the face plate push-button switch and also the RESET signal from the IPMC. The aTCA-9710 responds to any of these sources by initializing local peripherals.

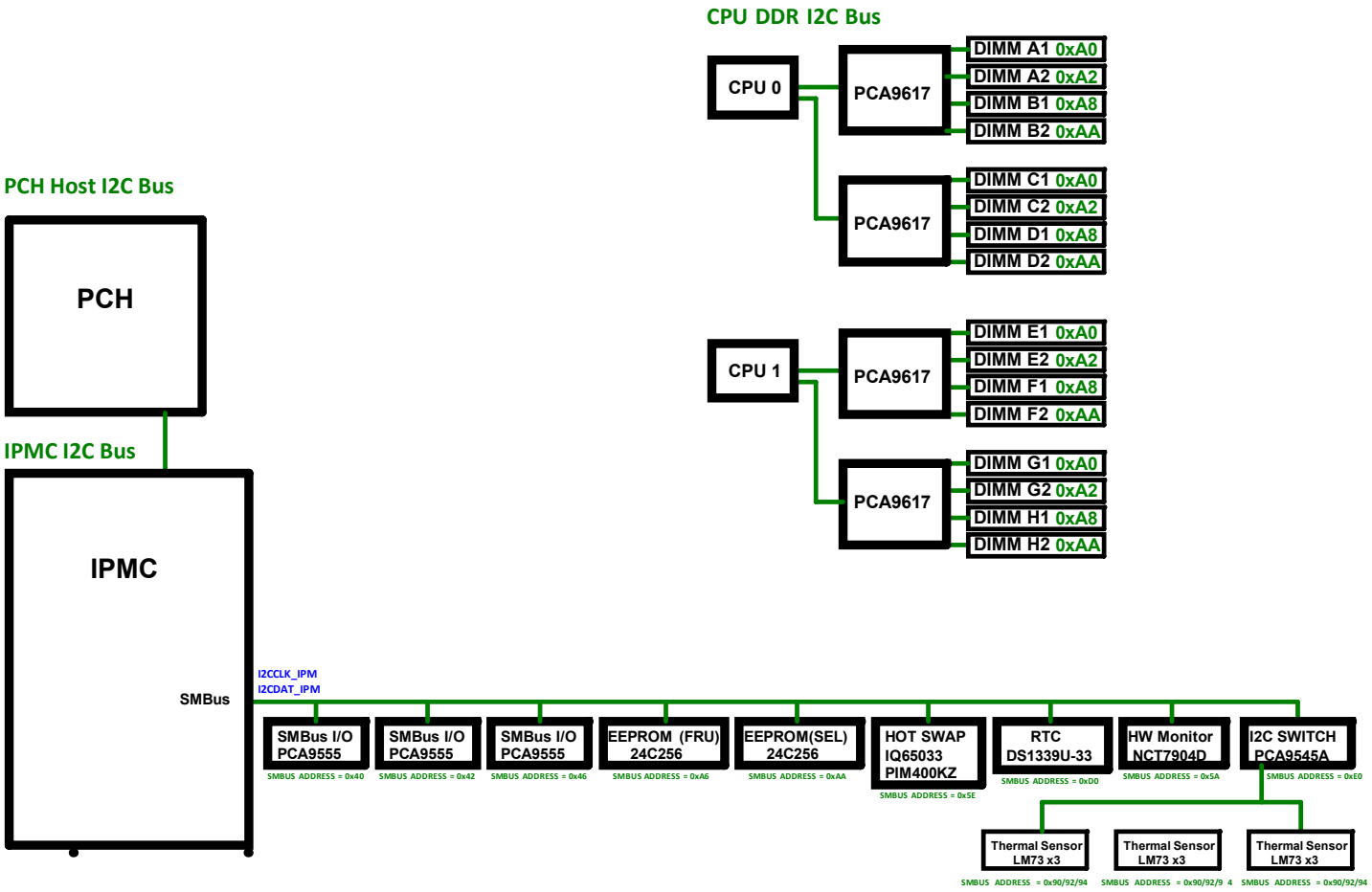
A reset will be generated by the following conditions:

- Power failure, +5 V supply falls below 4.1 V (typ.) or +3.3 V supply falls below 2.93 V (typ.)
- Pushbutton "RESET" pressed
- Watchdog time-out
- IPM controller reset

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3.2.2 SMBus Devices

The aTCA-9710 provides a System Management Bus (SMBus) hosted by the Intel® C612 PCH. The topology is shown in the diagram below.



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3.3 I/O Interfaces

3.3.1 USB

The aTCA-9710 supports Five USB 2.0 ports:

- 3x Type-A ports on front panel
- Two ports routed to RTM (available on the aTCA-R6280 RTM)

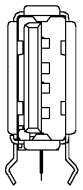
On the USB 2.0 front panel port, a USB cable up to 5 meters in length can be used.

On the USB 2.0 Rear I/O ports, it is strongly recommended to use a cable less than 3 meters in length for USB 2.0 devices.

The USB 2.0 ports are high-speed, full-speed, and low-speed capable. Hi-speed USB 2.0 allows data transfers of up to 480 Mb/s, 40 times faster than a full-speed USB (USB 1.1). One USB peripheral may be connected to each port.

With the aTCA-R6280 RTM, the aTCA-9710 supports two additional USB ports on the I/O panel of the RTM.

USB Connector Pin Definition (Type A)



Pin	Signal
1	5V USB VCC
2	USB-
3	USB+
4	GND USB

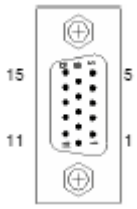
Note: The aTCA-9710 host interfaces can be used with a maximum 500mA continuous load current as specified in the Universal Serial Bus Specification, Revision 2.0. Short circuit protection is provided. All the signal lines are EMI filtered.

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3.3.2 VGA Interface

A DB-15 female connector on the front panel provides analog display output.

Front Panel VGA Pin Definition (DB-15)



Pin	Name	Pin	Name
1	RED	9	+5v
2	GREEN	10	GND
3	BLUE	11	NC
4	NC	12	DDC_DATA
5	GND	13	HSYNC
6	GND	14	VSYNC
7	GND	15	DDC_CLK
8	GND		

3.3.3 Ethernet Connection

The aTCA-9710 is equipped with one Intel® 82599ES 10Gigabit Ethernet Controller and one dual-port Intel® I350AM2 Gigabit Ethernet Controller which provide 2x 10GbE ports and 2x GbE ports in total. In default configuration, two ports from the Intel® 82599ES 10Gigabit Ethernet Controller are connected to the front panel SFP+ ports. Two GbE ports from the Intel® I350AM2 Gigabit Ethernet Controller are connected to Zone 2 Base Channels 1 and 2 (BCH1/BCH2).

Two Intel XL-710-AM2 40G network controllers are installed on the aTCA-9710 providing four 40GBASE KR4 links to Fabric Channels 1, 2, 3 and 4. The four 40GBASE-KR4 links are divided into two groups. FCH1/3 are connected to one of the XL-710-AM2 40G network controllers while FCH2/4 are connected to the other.

Note: The bandwidth of each XL-710 40G network controller is limited by the PCIe x8 Gen3 link to the CPU. The total bandwidth of each XL-710 40G network controller is approximately 50Gb/s.

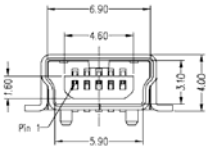
With the aTCA-R9700 RTM installed, the aTCA-9710 supports six 10GbE SFP+ ports from the Intel 82599ES Network Interface Controllers.

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3.3.4 Serial Port

Two serial ports are output to USB Mini-B connectors on the front panel for use as service terminals. The port labeled IPMI is an "IPMC" debug port and the port labeled CPU" is connected to COM 1 of the Super IO chip.

Serial Port Pin Definition (USB Mini-B)



Pin	Signal Name	In/Out
1	Signal Ground	
2	Transmitted Data (TxD)	Out
3	Received Data (RxD)	In
4	Signal Ground	
5	Signal Ground	

3.3.5 Onboard mSATA Module

The aTCA-9710 is equipped with an mSATA flash module (32GB, up to 256GB available) which supports a SATA 6.0Gb/s interface with sustained read to 550MB per second and sustained write up to 500MB per second.

3.3.6 Switch And Jumper Settings

3.3.6.1 Set Blade Operation Mode

Use switch SW4 to set the Blade Operation Mode. Normal operation requires a shelf manager for the blade to boot. Standalone mode allows the blade to boot without a shelf manager.

SW4 Blade Operation	Pin 1	Pin 2	Pin 3	Pin 4
Normal Mode (default)	OFF	OFF	OFF	OFF
Standalone Mode	OFF	OFF	ON	OFF

3.3.6.2 IPMC JTAG Signal

The switch SW3 is designed for hardware debug purposes. Do not change the default settings. Doing may result in an abnormal boot, failure to boot, and or damage to the board.

SW3 IPMC JTAG	Pin 1	Pin 2	Pin 3	Pin 4
Default Setting	OFF	ON	ON	ON

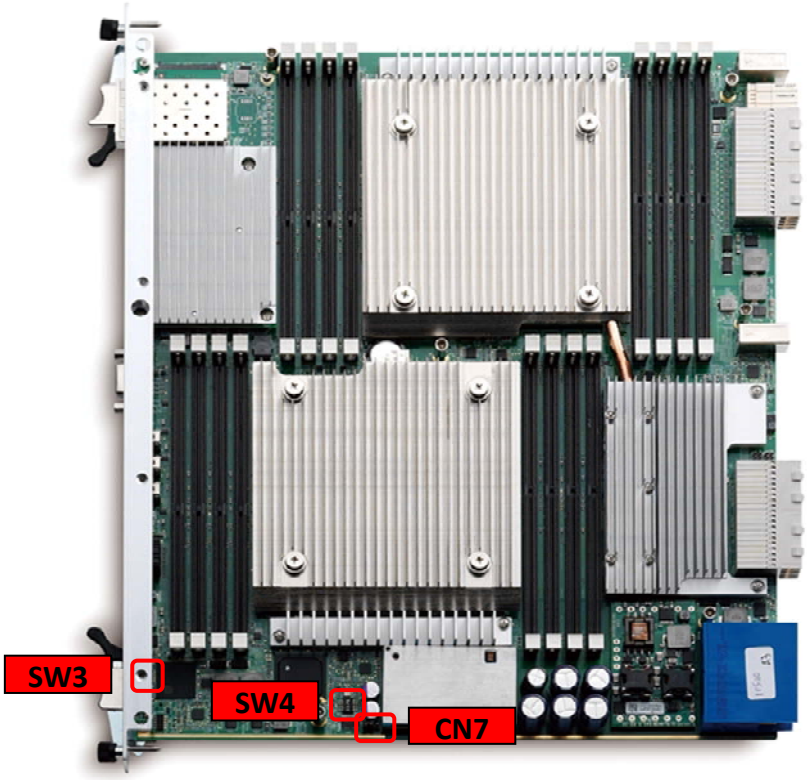
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3.3.6.3 Shelf/Logic Ground Jumper

Use CN7 to short Shelf Ground to Logic Ground.

Shelf/Logic GND	CN7 Setting
Shorted	1-2
Open (default)	2-3

The locations of SW3, SW4 and CN7 are shown below:



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4 Intelligent Platform Management System

The purpose of the intelligent platform management system is to monitor, control, and assure proper operation of AdvancedTCA® Boards and other Shelf components. The intelligent platform management system watches over the basic health of the system, reports anomalies, and takes corrective action when needed. The intelligent platform management system can retrieve inventory information and sensor readings as well as receive event reports and failure notifications from Boards and other Intelligent FRUs. The intelligent platform management system can also perform basic recovery operations such as reset of managed entities.

The IPMC controller on aTCA-9710 supports an “intelligent” hardware management system, based on the Intelligent Platform Management Interface Specification. The intelligent management system provides the ability to manage the power, cooling, and interconnect needs of intelligent devices; to monitor events; and to log events to a central repository.

4.1 IPMI Sensors

The following table lists all the sensors supported by the aTCA-9710. Six thresholds including Lower Non-Recoverable (LNR), Lower Critical (LC), Lower Non-Critical (LNC), Upper Non-Critical (UNC), Upper Critical (UC) and Upper Non-Critical (UNR) are defined for each voltage or temperature sensor.

Sensor	Type	Threshold					
		LNR	LC	LNC	UNC	UC	UNR
Hot Swap	Discrete	N/A	N/A	N/A	N/A	N/A	N/A
IPMB Physical	Discrete	N/A	N/A	N/A	N/A	N/A	N/A
BMC Watchdog	Discrete	N/A	N/A	N/A	N/A	N/A	N/A
Version change	Discrete	N/A	N/A	N/A	N/A	N/A	N/A
System FW PROG	Discrete	N/A	N/A	N/A	N/A	N/A	N/A
Health Status	Discrete	N/A	N/A	N/A	N/A	N/A	N/A
BIOS Boot	Discrete	N/A	N/A	N/A	N/A	N/A	N/A
48V Current(A)	Amps	N/A	N/A	N/A	N/A	N/A	N/A
48V_A Power(V)	Volts	75.075	72.15	57.2	43.225	39	36.075
48V_B Power(V)	Volts	75.075	72.15	57.2	43.225	39	36.075
1.8V I350	Volts	1.985	1.945	1.915	1.695	1.665	1.625
0.85V XL710_1	Volts	1.235	1.215	1.205	0.605	0.585	0.565
0.85V XL710_2	Volts	1.235	1.215	1.205	0.605	0.585	0.565
1.05V PCH	Volts	1.215	1.155	1.105	0.995	0.945	0.895
1.50V PCH	Volts	1.655	1.625	1.595	1.305	1.245	1.215
1.20V VGA	Volts	1.385	1.345	1.315	1.095	1.065	1.025
3.30V MGMT	Volts	3.633	3.573	3.513	3.105	3.044	2.984
3.30V SYS	Volts	3.633	3.573	3.513	3.105	3.044	2.984

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Sensor	Type	Threshold					
		LNR	LC	LNC	UNC	UC	UNR
5.00V SYS	Volts	5.502	5.408	5.314	4.703	4.609	4.515
12.0V SYS	Volts	13.24	13	12.76	11.32	11.08	10.84
1.05V VCCIO	Volts	1.216	1.168	1.104	0.992	0.96	0.896
1.80V VCCIN_CPU0	Volts	1.856	1.84	1.824	1.6	1.536	1.456
1.80V VCCIN_CPU1	Volts	1.856	1.84	1.824	1.6	1.536	1.456
1.20V VDDQ_AB	Volts	1.392	1.344	1.312	1.104	1.056	1.024
1.20V VDDQ_CD	Volts	1.392	1.344	1.312	1.104	1.056	1.024
1.20V VDDQ_EF	Volts	1.392	1.344	1.312	1.104	1.056	1.024
1.20V VDDQ_GH	Volts	1.392	1.344	1.312	1.104	1.056	1.024
0.60V VTT_AB	Volts	0.72	0.688	0.64	0.576	0.528	0.496
0.60V VTT_CD	Volts	0.72	0.688	0.64	0.576	0.528	0.496
0.60V VTT_EF	Volts	0.72	0.688	0.64	0.576	0.528	0.496
0.60V VTT_GH	Volts	0.72	0.688	0.64	0.576	0.528	0.496
CPU1 Temp	°C	107	97	87	-5	-10	-15
CPU2 Temp	°C	107	97	87	-5	-10	-15
PCH Temp	°C	95	85	75	0	-5	-10
DC/DC Temp	°C	95	85	75	0	-5	-10
XL710 Temp	°C	95	85	75	0	-5	-10
CPU1 VRM1 Temp	°C	95	85	75	0	-5	-10
CPU1 VRM2 Temp	°C	95	85	75	0	-5	-10
CPU1 VRM3 Temp	°C	95	85	75	0	-5	-10
CPU2 VRM1 Temp	°C	95	85	75	0	-5	-10
CPU2 VRM2 Temp	°C	95	85	75	0	-5	-10
CPU2 VRM3 Temp	°C	95	85	75	0	-5	-10

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4.1.1 Sensor Reading (FRU Hotswap Sensor)

	Byte	Data field
Request data	1	Sensor Number (FFh = reserved)
Response data	1	Completion Code
	2	Sensor Reading. [7:0] - Not used. Write as 00h.
	3	Standard IPMI byte (See “Get Sensor Reading” in IPMI specification): [7] - 0b = All Event Messages disabled from this sensor [6] - 0b = sensor scanning disabled [5] - 1b = initial update in progress. This bit is set to indicate that a “Re-arm Sensor Events” or “Set Event Receiver” command has been used to request an update of the sensor status, and that update has not occurred yet. Software should use this bit to avoid getting an incorrect status while the first sensor update is in progress. This bit is only required if it is possible for the IPM Controller to receive and process a “Get Sensor Reading or Get Sensor Event Status” command for the sensor before the update has completed. This is most likely to be the case for sensors, such as fan RPM sensors, that may require seconds to accumulate the first reading after a re-arm. [4:0] – reserved. Ignore on read.
	4	Current State Mask [7] – 1b = FRU Operational State M7 - Communication Lost [6] – 1b = FRU Operational State M6 - FRU Deactivation In Progress [5] – 1b = FRU Operational State M5 - FRU Deactivation Request [4] – 1b = FRU Operational State M4 - FRU Active [3] – 1b = FRU Operational State M3 - FRU Activation in Progress [2] – 1b = FRU Operational State M2 - FRU Activation Request [1] – 1b = FRU Operational State M1 - FRU Inactive [0] – 1b = FRU Operational State M0 - FRU Not Installed
	(5)	[7:0] – Optional/Reserved. If provided, write as 80h (IPMI restriction). Ignore on read.

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4.1.2 Get Sensor Reading (Physical IPMB-0 Sensor)

	Byte	Data field
Request data	1	Sensor Number (FFh = reserved)
Response data	1	Completion Code
	2	[7] – IPMB B Override State 0b = Override state, bus isolated 1b = Local Control state - IPM Controller determines state of bus. [6:4] = IPMB B Local Status 0h = No Failure. Bus enabled if no override in effect. 1h = Unable to drive clock HI 2h = Unable to drive data HI 3h = Unable to drive clock LO 4h = Unable to drive data LO 5h = Clock low timeout 6h = Under test (the IPM Controller is attempting to determine if it is causing a bus hang). 7h = Undiagnosed Communications Failure [3] – IPMB A Override State 0b = Override state, bus isolated 1b = Local Control state - IPM Controller determines state of bus. [2:0] = IPMB A Local Status 0h = No failure. Bus enabled if no override in effect. 1h = Unable to drive clock HI 2h = Unable to drive data HI 3h = Unable to drive clock LO 4h = Unable to drive data LO 5h = Clock low timeout 6h = Under test (the IPM Controller is attempting to determine if it is causing a bus hang). 7h = Undiagnosed Communications Failure
	3	Standard IPMI byte (see “Get Sensor Reading” in IPMI specification) [7] – 0b = All Event Messages disabled from this sensor [6] – 0b = Sensor scanning disabled [5] – 1b = Initial update in progress. This bit is set to indicate that a “Re-arm Sensor Events” or “Set Event Receiver” command has been used to request an update of the sensor status, and that update has not occurred yet. Software should use this bit to avoid getting an incorrect status while the first sensor update is in progress. This bit is only required if it is possible for the controller to receive and process a “Get Sensor Reading” or “Get Sensor Event Status” command for the sensor before the update has completed. This is most likely to be the case for sensors, such as fan RPM sensors, that may require seconds to accumulate the first reading after a re-arm. [4:0] – Reserved. Ignore on read.
	4	[7:4] – Reserved. Write as 0h, ignore on read [3] 1b = IPMB A enabled, IPMB-B enabled [2] 1b = IPMB A disabled, IPMB-B enabled [1] 1b = IPMB-A enabled, IPMB-B disabled [0] 1b = IPMB A disabled, IPMB-B disabled
	(5)	[7:0] – Optional/Reserved. If provided, write as 80h (IPMI restriction). Ignore on read.

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4.1.3 Watchdog Timer Sensor

Sensor Type	Sensor Type Code	Sensor Specific Offset	Event
Watchdog 2	23h		This sensor is recommended for new IPMI v1.0 and later implementations.
		00h	Timer expired, status only (no action, no interrupt)
		01h	Hard Reset
		02h	Power Down
		03h	Power Cycle
		04h-07h	reserved
		08h	Timer interrupt
			The Event Data 2 field for this command can be used to provide an event extension code, with the following definition: 7:4 interrupt type 0h = none 1h = SMI 2h = NMI 3h = Messaging Interrupt Fh = unspecified all other = reserved 3:0 timer use at expiration: 0h = reserved 1h = BIOS FRB2 2h = BIOS/POST 3h = OS Load 4h = SMS/OS 5h = OEM Fh = unspecified all other = reserved

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4.1.4 Version Change Sensor

Sensor Type	Sensor Type Code	Sensor Specific Offset	Event
Version Change	2Bh	00h	00h Intelligent change detected with associated Entity. Informational. This offset does not imply whether the intelligent change was successful or not. Only that a change occurred.
		01h	01h Firmware or software change detected with associated Entity.Informational. Success or failure not implied.
		02h	02h Intelligent incompatibility detected with associated Entity.
		03h	03h Firmware or software incompatibility detected with associated Entity.
		04h	04h Entity is of an invalid or unsupported intelligent version.
		05h	05h Entity contains an invalid or unsupported firmware or software version.
		06h	06h Intelligent Change detected with associated Entity was successful. (deassertion event means unsuccessful').
		07h	07h Software or F/W Change detected with associated Entity was successful. (deassertion event means 'unsuccessful') *Event data 2 can be used for additional event information on the type of version change, with the following definition:* Event Data 2 7:0 Version change type 00h unspecified 01h management controller device ID (change in one or more fields from 'Get Device ID') 02h management controller firmware revision 03h management controller device revision 04h management controller manufacturer ID 05h management controller IPMI version 06h management controller auxiliary firmware ID 07h management controller firmware boot block 08h other management controller firmware 09h system firmware (EFI/BIOS) change 0Ah SMBIOS change 0Bh operating system change 0Ch operating system loader change 0Dh service or diagnostic partition change 0Eh management software agent change 0Fh management software application change 10h management software middleware change 11h programmable intelligent change (e.g. FPGA) 12h board/FRU module change (change of a module plugged into associated entity) 13h board/FRU component change (addition or removal of a replaceable component on the board/FRU that is not tracked as a FRU) 14h board/FRU replaced with equivalent version 15h board/FRU replaced with newer version 16h board/FRU replaced with older version 17h board/FRU intelligent configuration change (e.g. strap, jumper, cable change, etc.)

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4.1.5 System Firmware Progress Sensor

Sensor Type	Sensor Type Code	Sensor Specific Offset	Event
System Firmware Progress (formerly POST Error)	0Fh	00h	System Firmware Error (POST Error) The Event Data 2 field can be used to provide an event extension code, with the following definition: Event Data 2 00h Unspecified. 01h No system memory is physically installed in the system. 02h No usable system memory, all installed memory has experienced an unrecoverable failure. 03h Unrecoverable hard-disk/ATAPI/IDE device failure. 04h Unrecoverable system-board failure. 05h Unrecoverable diskette subsystem failure. 06h Unrecoverable hard-disk controller failure. 07h Unrecoverable PS/2 or USB keyboard failure. 08h Removable boot media not found 09h Unrecoverable video controller failure 0Ah No video device detected 0Bh Firmware (BIOS) ROM corruption detected 0Ch CPU voltage mismatch (processors that share same supply have mismatched voltage requirements) 0Dh CPU speed matching failure 0Eh to FFh reserved System Firmware Hang (uses same Event Data 2 definition as following System Firmware Progress offset) System Firmware Progress The Event Data 2 field can be used to provide an event extension code, with the following definition: Event Data 2 00h Unspecified.
		01h	01h Memory initialization. 02h Hard-disk initialization 03h Secondary processor(s) initialization 04h User authentication 05h User-initiated system setup
		02h	06h USB resource configuration 07h PCI resource configuration 08h Option ROM initialization 09h Video initialization 0Ah Cache initialization 0Bh SM Bus initialization 0Ch Keyboard controller initialization 0Dh Embedded controller/management controller initialization 0Eh Docking station attachment 0Fh Enabling docking station 10h Docking station ejection 11h Disabling docking station 12h Calling operating system wake-up vector

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Sensor Type	Sensor Type Code	Sensor Specific Offset	Event
			13h Starting operating system boot process, e.g. calling Int 19h 14h Baseboard or motherboard initialization 15h reserved 16h Floppy initialization 17h Keyboard test 18h Pointing device test 19h Primary processor initialization 1Ah to FFh reserved

4.1.6 Get Sensor Reading Command

	Byte	Data field
Request data	1	Sensor Number (FFh = reserved)
Response data	1	Completion Code
	2	Sensor reading Byte 1: byte of reading. Ignore on read if sensor does not return an numeric (analog) reading.
	3	[7] - 0b = All Event Messages disabled from this sensor [6] - 0b = sensor scanning disabled [5] - 1b = reading/state unavailable (formerly “initial update in progress”). This bit is set to indicate that a ‘re-arm’ or ‘Set Event Receiver’ command has been used to request an update of the sensor status, and that update has not occurred yet. Software should use this bit to avoid getting an incorrect status while the first sensor update is in progress. This bit is only required if it is possible for the controller to receive and process a ‘Get Sensor Reading’ or ‘Get Sensor Event Status’ command for the sensor before the update has completed. This is most likely to be the case for sensors, such as fan RPM sensors, that may require seconds to accumulate the first reading after a re-arm. The bit is also used to indicate when a reading/state is unavailable because the management controller cannot obtain a valid reading or state for the monitored entity, typically because the entity is not present. For more in formation, please see *Section 16.4, Event Status, Even Conditions, and Present State* and *Section 16.6, Re-arming* on the PICMG specification 3.0. [4:0] - reserved. Ignore on read.
	4	For threshold-based sensors Present threshold comparison status [7:6] - reserved. Returned as 1b. Ignore on read. [5] - 1b = at or above (≥) upper non-recoverable threshold [4] - 1b = at or above (≥) upper critical threshold [3] - 1b = at or above (≥) upper non-critical threshold [2] - 1b = at or below (≤) lower non-recoverable threshold [1] - 1b = at or below (≤) lower critical threshold [0] - 1b = at or below (≤) lower non-critical threshold For discrete reading sensors [7] - 1b = state 7 asserted [6] - 1b = state 6 asserted [5] - 1b = state 5 asserted [4] - 1b = state 4 asserted [3] - 1b = state 3 asserted

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	Byte	Data field
		[2] - 1b = state 2 asserted [1] - 1b = state 1 asserted [0] - 1b = state 0 asserted
	(5)	For discrete reading sensors only. (Optional) (00h Otherwise) [7] - reserved. Returned as 1b. Ignore on read. [6] - 1b = state 14 asserted [5] - 1b = state 13 asserted [4] - 1b = state 12 asserted [3] - 1b = state 11 asserted [2] - 1b = state 10 asserted [1] - 1b = state 9 asserted [0] - 1b = state 8 asserted

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4.2 IPMI Commands

The following table presents all the commands which are supported by the aTCA-9710 in different interfaces and compatible with IPMI v1.5 and PICMG 3.0 R2.0 ECN001.

There are two interfaces implemented with IPMI command support.
(1) KCS: OpenIpmi; (2) IPMB0: IPMBa & IPMBb

	KCS	IPMB0
IPMI Command		
IPM Device "Global" Commands		
Get Device ID	●	●
Cold Reset	●	●
Warm Reset	●	●
Get Self Test Results	●	●
Get Device GUID	●	●
IPMI Messaging Support Commands		
Set BMC Global Enables	●	●
Get BMC Global Enables	●	●
Clear Message Flags	●	●
Get Message Flags	●	●
Get Message	●	●
Send Message	●	●
Master Write-Read	●	●
BMC Watchdog Timer		
Reset Watchdog Timer	●	●
Set Watchdog Timer	●	●
Get Watchdog Timer	●	●
Chassis Device Commands		
Chassis Identify	●	●
Set System Boot Option	●	●
Get System Boot Option	●	●
Event Commands		
Set Event Receiver	●	●
Get Event Receiver	●	●
Platform Event	●	●
Sensor Device Commands		
Get Device SDR Info	●	●
Get Device SDR	●	●
Reserve Device SDR Repository	●	●
Get Sensor Reading Factors	●	●
Set Sensor Hysteresis	●	●
Get Sensor Hysteresis	●	●
Set Sensor Threshold	●	●
Get Sensor Threshold	●	●
Set Sensor Event Enable	●	●
Get Sensor Event Enable	●	●
Rearm Sensor Events	●	●
Get Sensor Event Status	●	●
Get Sensor Reading	●	●

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FRU Device Commands		
Get FRU Inventory Area Info	●	●
Read FRU Data	●	●
Write FRU Data	●	●
PICMG Command		
HPM.1 Upgrade Commands (HPM.1)		
Get target upgrade capabilities	●	●
Get component properties	●	●
Abort Firmware Upgrade	●	●
Initiate upgrade action	●	●
Upload firmware block	●	●
Finish firmware upload	●	●
Get upgrade status	●	●
Activate firmware	●	●
Query Self-test Results	●	●
Query Rollback status	●	●
Initiate Manual Rollback	●	●
AdvancedTCA		
Get PICMG Properties	●	●
Get Address Info	●	●
FRU Control	●	●
FRU Control Capabilities	●	●
Get FRU LED Properties	●	●
Get LED Color Capabilities	●	●
Set FRU LED State	●	●
Get FRU LED State	●	●
Set IPMB State		●
Set FRU Activation Policy	●	●
Get FRU Activation Policy	●	●
Set FRU Activation	●	●
Get Device Locator Record ID	●	●
Get Port State	●	●
Set Port State		●
Compute Power Properties		●
Set Power Level		●
Get Power Level	●	●
Bused Resource Control		●
Get IPMB Link Info	●	●
SET_CLOCK_STATE	●	●
GET_CLOCK_STATE	●	●
Get AMC-Port State		●
Set AMC-Port State		●

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5 Getting Started

The aTCA-9710 has been designed for easy installation. However, the following standard precautions, installation procedures, and general information must be observed to ensure proper installation and to preclude damage to the board, other system components, or injury to personnel.

5.1 Safety Requirements

The following safety precautions must be observed when installing or operating the aTCA-9710. ADLINK assumes no responsibility for any damage resulting from failure to comply with these requirements.

Exercised due care when handling the board as the heat sink can get very hot. Do not touch the heat sink when installing or removing the board. The board should not be placed on any surface or in any form of storage container until the board and heat sink have cooled down to room temperature.

This ATCA blade contains electrostatic sensitive devices. Please observe the necessary precautions to avoid damage to your board:

- Discharge your clothing before touching the assembly. Tools must be discharged before use.
- Do not touch components, connector-pins or traces.
- If working at an anti-static workbench with professional discharging equipment, please do not omit to use it.

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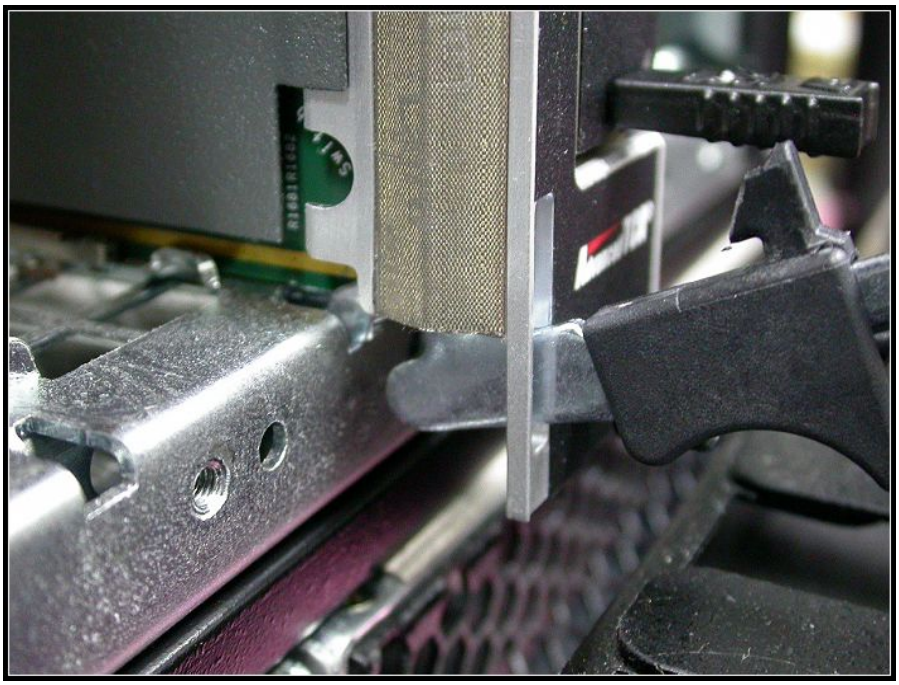
5.2 Installing and Removing the aTCA-9710

5.2.1 Installing the Blade

Follow these steps to install the aTCA-9710 blade to the chassis.

Step 1

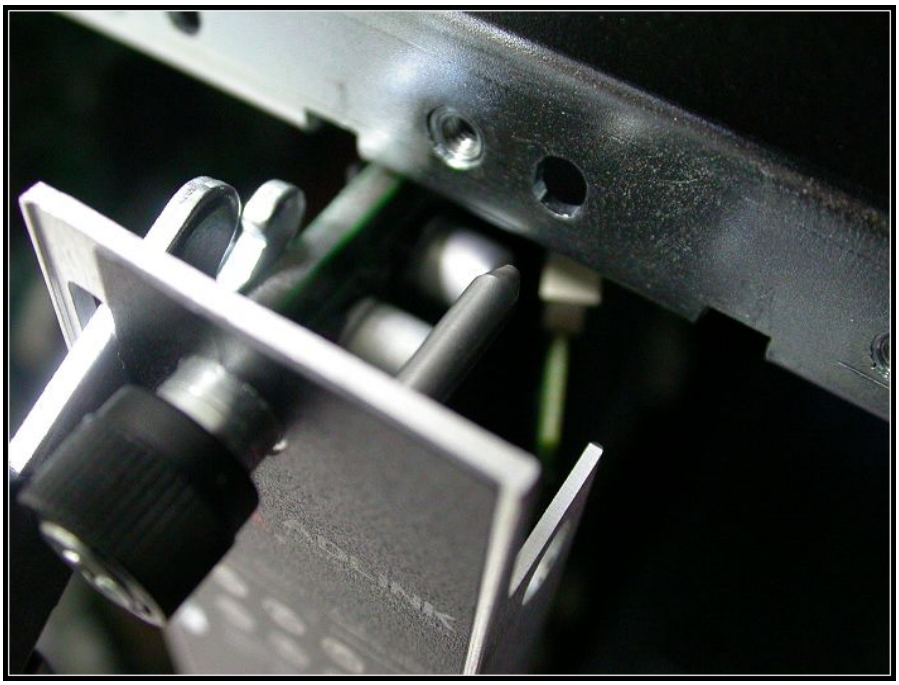
Carefully align the board edges with the chassis guide rails and push the blade inwards.



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Step 2

Check if the catch hooks and alignment pins at both ends of the module are correctly inserted into the proper openings. Push inwards on the handles until the blade is firmly seated in the chassis. (Do not force the handles if there is any abnormal resistance or it could damage the connectors and/or backplane.)

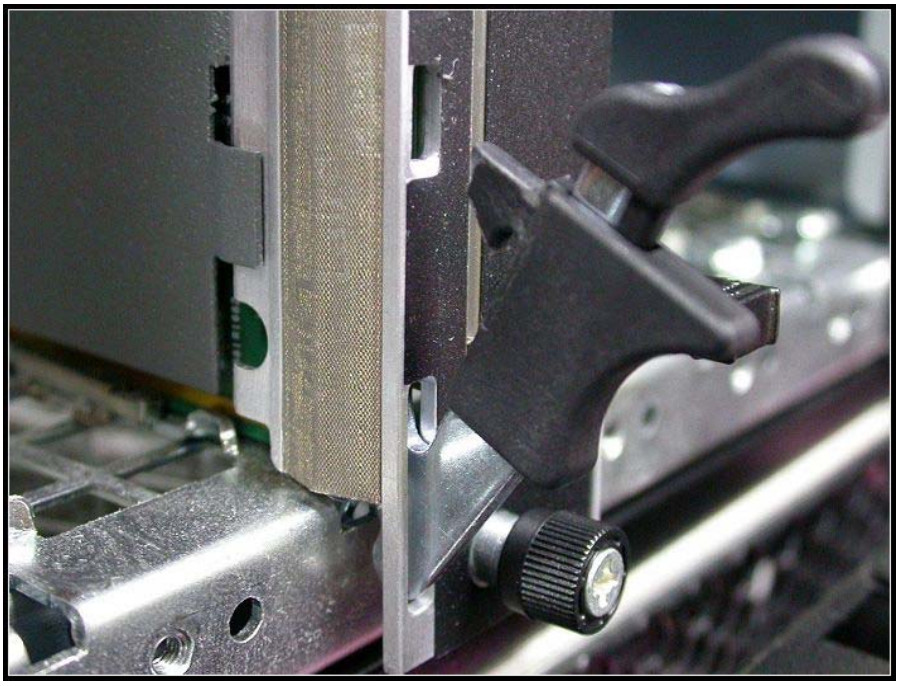




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Step 3

Push the ejector handles inwards until it is locked.





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Step 4

Lock both ends of the captive screws.



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5.2.2 Removing the Blade

Follow these steps to remove the aTCA-9710 blade from the chassis.

Step 1

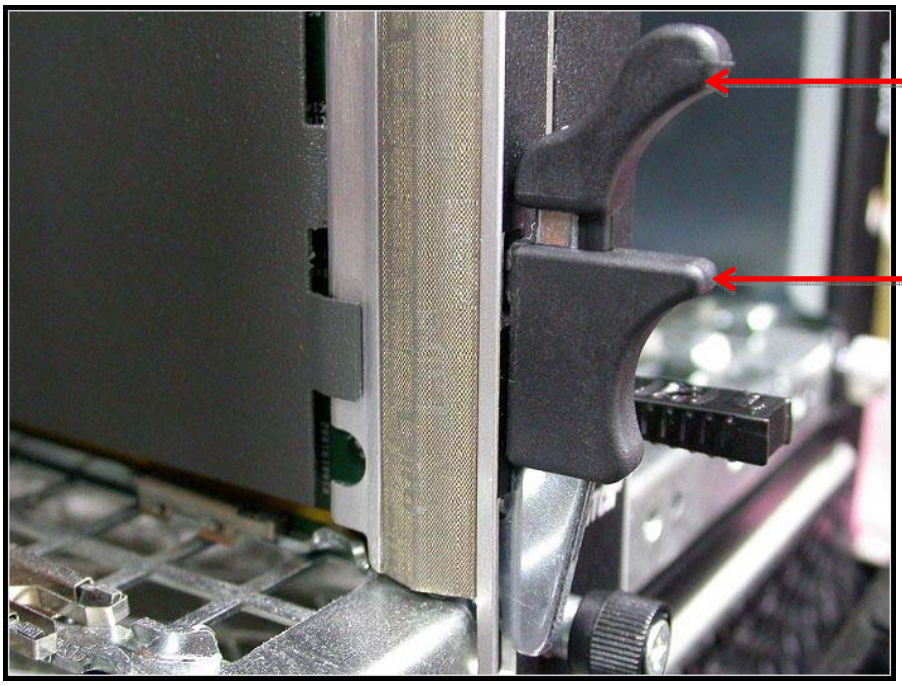
Unlock both ends of the captive screws.



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Step 2

Pinch the lever and latch together then pull outwards to release the ejector handles at both ends.

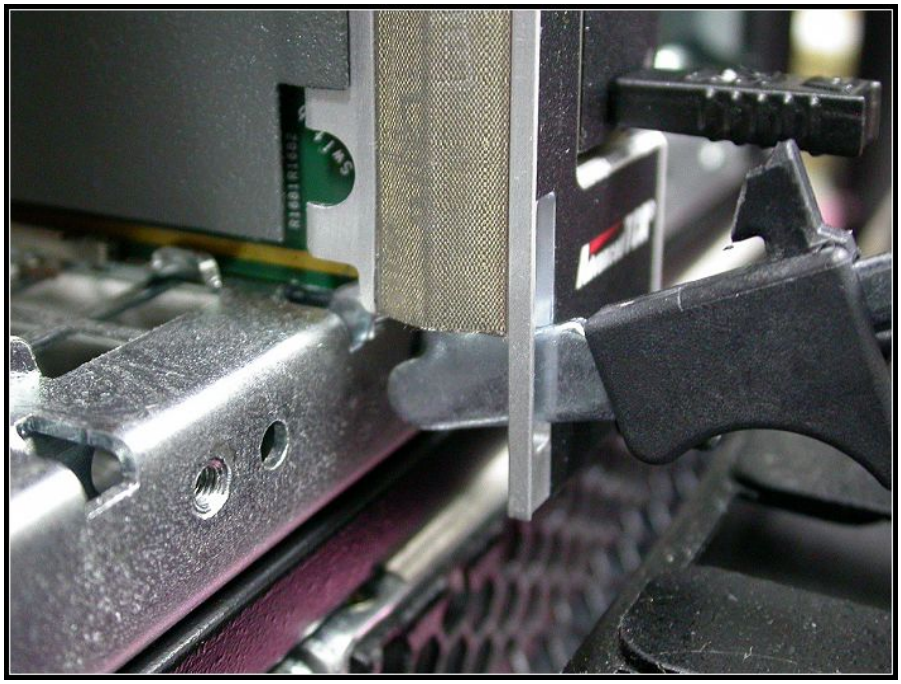




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Step 3

Pull the blade outwards from the chassis until it is removed.



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5.3 Firmware Update Procedure

The aTCA-9710 supports firmware update (IPMC FW, BIOS, FRU) over various interfaces (LAN, KCS, serial interface or IPMB). Please follow the procedures listed below to update the IPMC firmware.

Note: IPMB-0 will be disabled during the process of upgrading IPMC firmware. This is a limitation of the IPMC controller (SmartFusion A2F500)

5.3.1 Update Over Serial Interface

The following IPMItool command line parameters are used for communicating with the carrier IPMC via a serial interface:

- **-I serial-terminal**

This parameter instructs the IPMItool utility to use the serial interface for communications with the carrier IPMC.

- **-D <dev[:baudrate]>**

This parameter specifies the serial device and baud rate settings to use. For Linux hosts, the serial device is the system path to the device node (e.g. /dev/ttyS0).

Perform the following steps to update the IPMC firmware**:**

Step 1: Prepare an external host PC with Linux OS and connect it to the serial port on the aTCA-9710 via the COM port (USB Mini-B on the front panel). Put the IPMItool utility and new firmware image on the host PC. Enter the following command:

Step 2: Enter “y” when prompted and wait until the string “firmware update procedure successful” is displayed.

To update other images (BIOS, FRU, etc), just replace the target image and the file name while typing command.

Item	File name
IPMC firmware	hpm1fw.img
BIOS	hpm1bios.img

Note:
1. The hpm1bios.img always updates the backup BIOS image.
2. Make sure the payload power is off (M1 state) before updating the IPMC firmware

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5.3.2 Update over KCS

Step1: Prepare an aTCA-9710 with Linux system. Enter the following command to make sure the ipmi_si and ipmi_devintf modules are loaded before the IPMItool utility can be used.

Step2: Put IPMItool and “target image” in the Linux system then enter the following command:

Step3: Select “y” and wait until the string of “firmware update procedure successful” is displayed.

To update other images (BIOS, FRU, etc), just replace the target image and the file name while typing command.

Item	File name
IPMC firmware	hpm1fw.img
BIOS	hpm1bios.img

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5.3.3 Update over LAN

The following IPMItool command line parameters are used for communicating with the carrier IPMC via LAN:

- **-I lan**

The parameter instructs the IPMItool utility to use the RMCP protocol for communicating with the IPMC.

- **-H <IP address >**

The parameter specifies the IP address of the IPMC.

Please follow the step to update firmware**:**

Step1: Prepare an external x86 PC and connect the target aTCA-9710 via BASE Interface. Put IPMItool and “target image” on the x86 PC with Linux system. Enter the following command:

Step2: Select “y” and wait until the string of “firmware update procedure successful” is displayed.

To update other images (BIOS, FRU, etc), just replace the target image and the file name while typing command.

Item	File name
IPMC firmware	hpm1fw.img
BIOS	hpm1bios.img

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6 BIOS

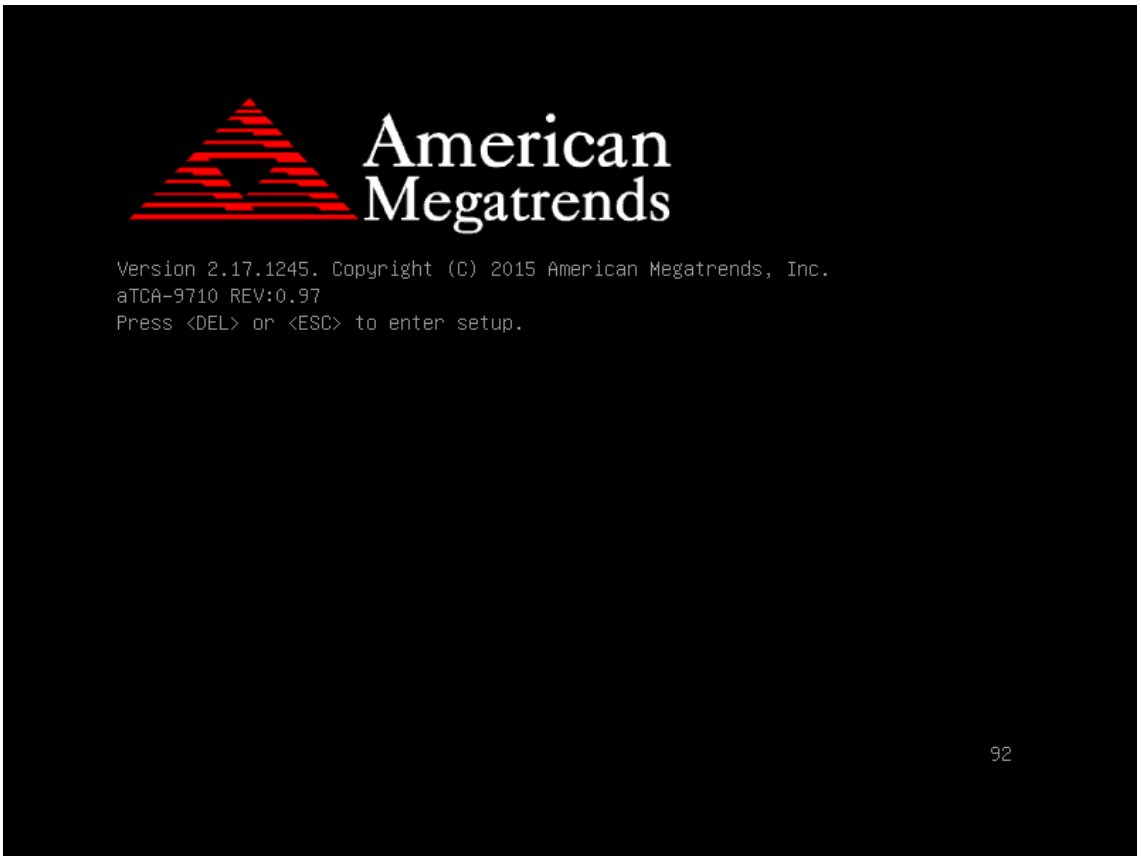
This chapter will guide you how to configure BIOS setup items. There will be detailed description for each BIOS setup item in the following sections.

6.1 Entering the BIOS Setup Screen

To enter the setup screen, follow these steps:

Step 1: Power on the aTCA-9710.

Step 2: Press the <DEL> key on a USB keyboard when you see the following text prompt on boot up screen.

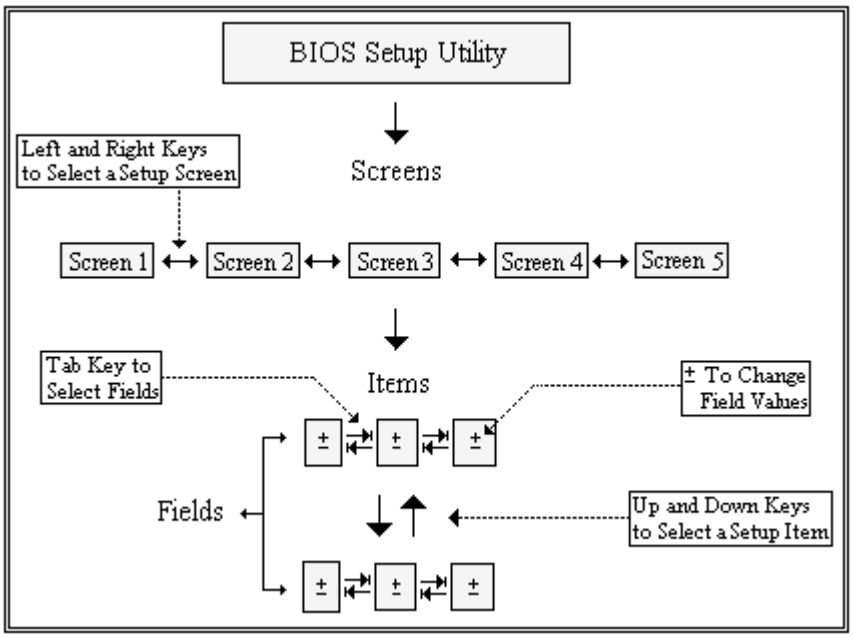


Step 3: After you press the <DEL> key, the Main BIOS setup menu will be displayed. You can access the other setup screen from the BIOS setup utility, such as CPU configuration, USB configuration and so on.

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6.1.1 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>, <F2>, <F3>, <F4>, <ESC>, <Enter>, <Arrow> keys, and so on.



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

→←	Left/Right. The *Left and Right* < Arrow > keys allow you to select a setup screen.
↑↓	Up/Down The *Up and Down* < Arrow > keys allow you to select a setup 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.
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. 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.
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.

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6.2 Main BIOS Setup Screen

The Main BIOS setup menu is the screen where you start navigation of the BIOS setting menus. You can always return to the Main setup screen by selecting the Main tab. Each BIOS setup menu option is described in the following sections. There are two parts of the Main BIOS setup menu screen. The left part of the screen displays the available options. The user can configure the options in blue text. The selected option will appear highlighted in white text. Options in gray text are for information only. The upper right part of the screen displays the description of the selected option. The lower right part of the screen shows the navigation keys that user can use. The Main setup screen is shown below.



System Language

Choose the language of BIOS setup utility. So far, there is only “English” is supported on aTCA-9710.

System Time/System Date

Use these two options to change 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.

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System & Board Information

The Main BIOS setup screen reports memory and board information.

BIOS Vendor

Reports the BIOS vendor of aTCA-9710's BIOS. American Megatrend, Inc. is the BIOS vendor that aTCA-9710 is using.

Core Version

Shows what core version is used from AMI to develop aTCA-9710's BIOS.

Compliancy

Shows what version of EFI specification is compliant with aTCA-9710's BIOS.

BIOS Revision

Shows revision of aTCA-9710's BIOS.

Build Date and Time

Shows date and time that aTCA-9710 BIOS is released.

Total Memory

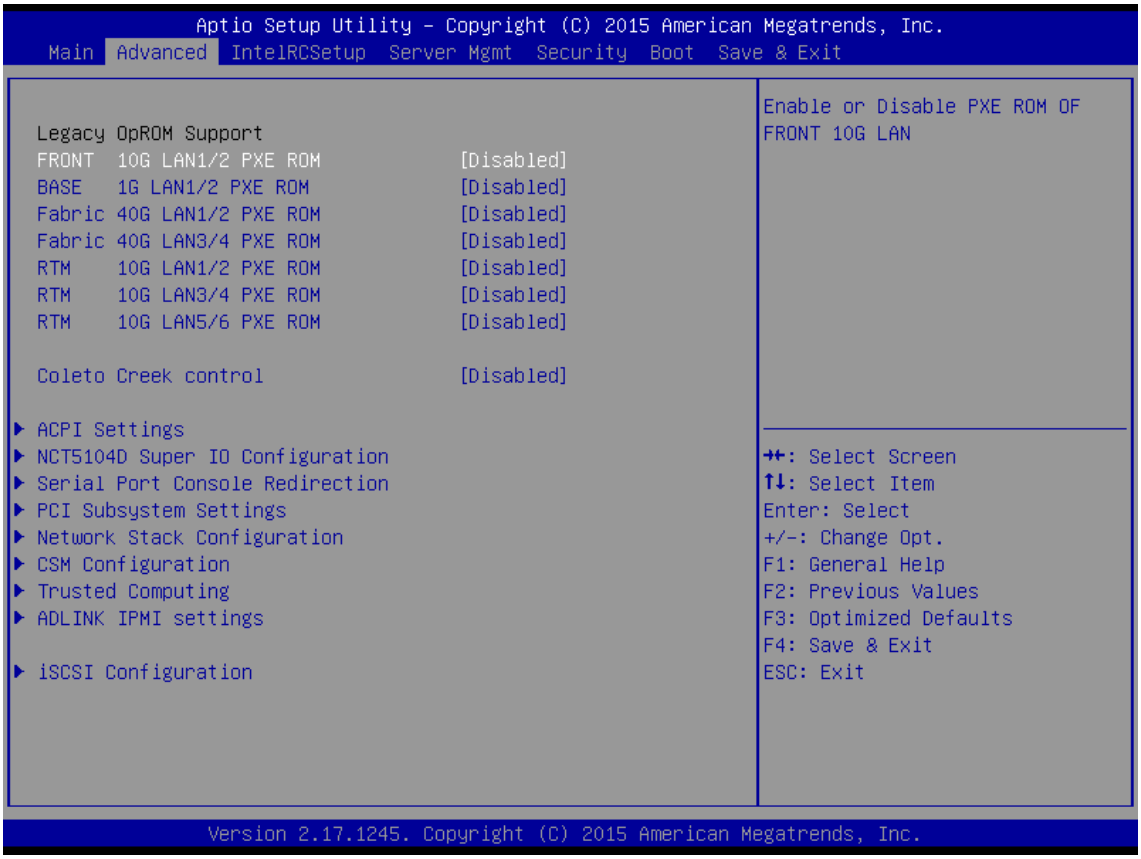
Shows the memory size on aTCA-9710.

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6.3 Advanced Setup Screen

Select the ***Advanced*** tab from the setup screen to enter ***Advanced*** BIOS setup screen. You can select any of items in the left frame of the screen, such as CPU configuration, to go to the sub menu for that item. You can select an ***Advanced*** BIOS sub menu or option by highlighting it using the <Arrow> keys. The Advanced BIOS setup screen is shown below.

The sub menus are described in the following sections.



Front 10G LAN1/2 PXE ROM

Enable or Disable PXE ROM OF FRONT 10G LAN.
Set this value to **Enabled/Disabled**.

BASE 1G LAN1/2 PXE ROM

Enable or Disable PXE ROM OF BASE 1G LAN.
Set this value to **Enabled/Disabled**.

Fabric 40G LAN1/2 PXE ROM

Enable or Disable PXE ROM OF Fabric 40G LAN1/2.
Set this value to **Enabled/Disabled**.

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Fabric 40G LAN3/4 PXE ROM

Enable or Disable PXE ROM OF Fabric 40G LAN3/4.
Set this value to **Enabled/Disabled**.

RTM 10G LAN1/2 PXE ROM

Enable or Disable PXE ROM OF RTM 10G LAN1/2.
Set this value to **Enabled/Disabled**.

RTM 10G LAN3/4 PXE ROM

Enable or Disable PXE ROM OF RTM 10G LAN3/4.
Set this value to **Enabled/Disabled**.

RTM 10G LAN5/6 PXE ROM

Enable or Disable PXE ROM OF RTM 10G LAN5/6.
Set this value to **Enabled/Disabled**.

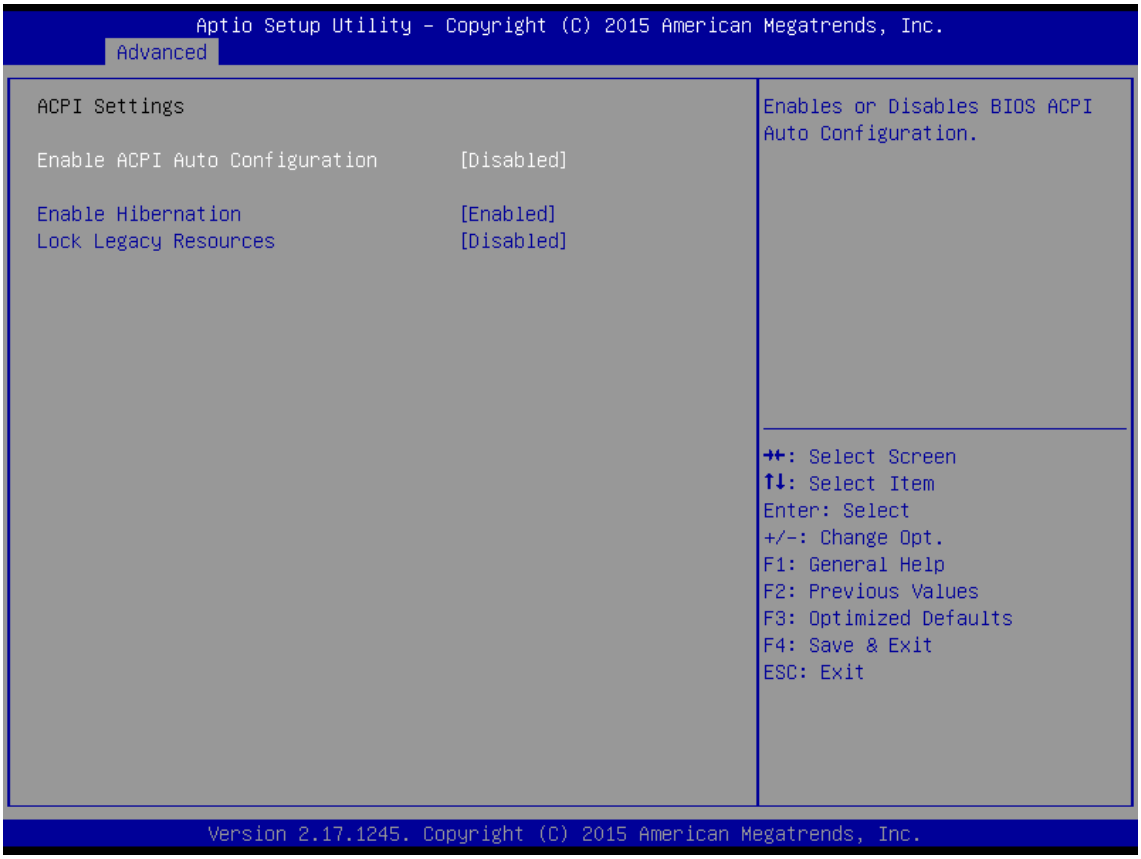
Coleto Creek Control

Enable or Disable Coleto Creek plug-in card.
Set this value to **Enabled/Disabled**.

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6.3.1 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.



Enable ACPI Auto Configuration

Enables or Disables BIOS ACPI Auto Configuration. Set this value to **Enabled/Disabled**.

Enable Hibernation

Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS. Set this value to **Enabled/Disabled**.

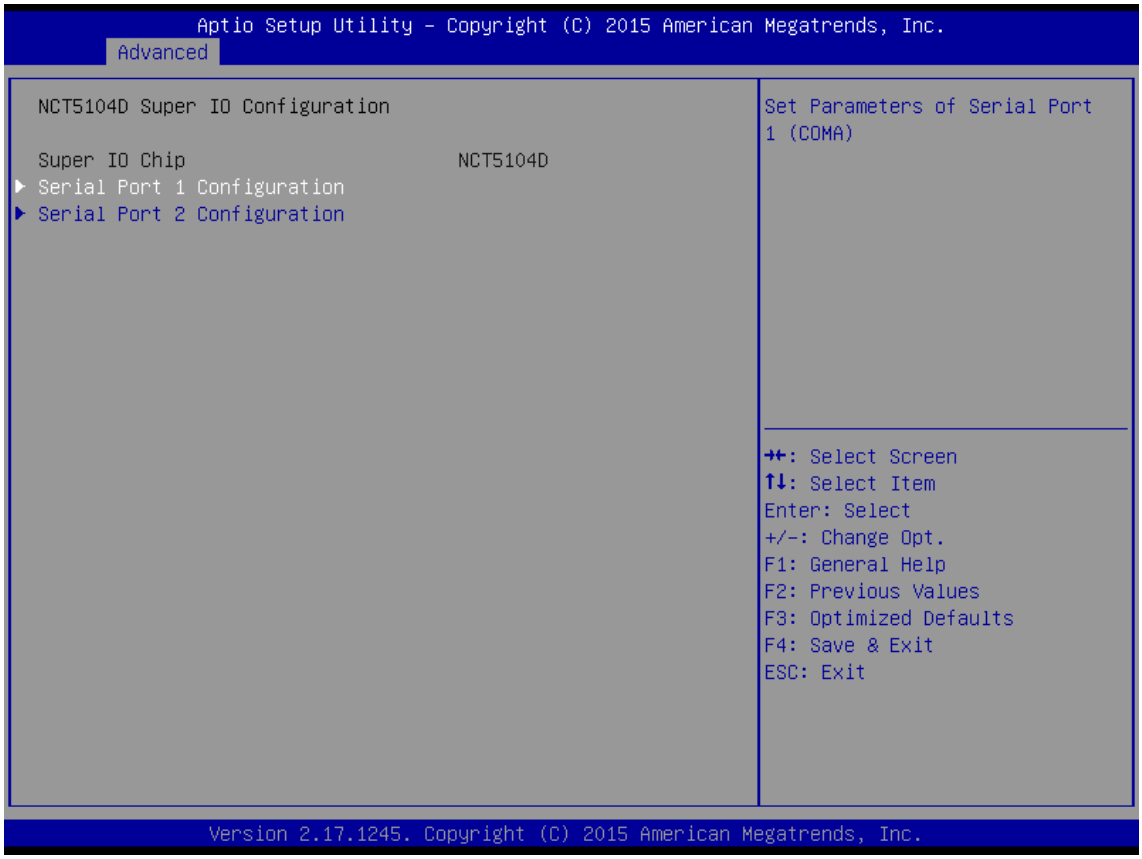
Lock Legacy Resources

Enables or Disables Lock of Legacy Resources. Set this value to **Enabled/Disabled**.

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6.3.2 NCT5104D Super IO Configuration

You can use this screen to select options for the NCT5104D Super IO Configuration. 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



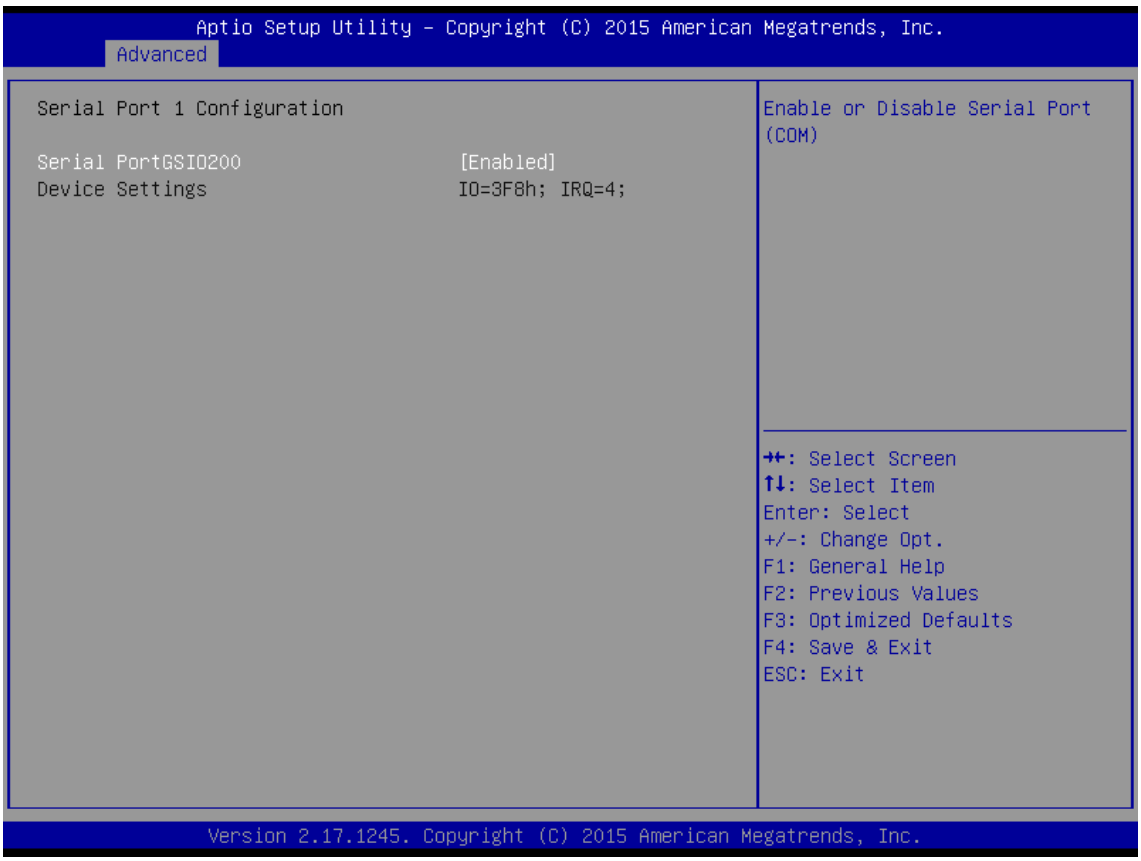
Serial Port 1 Configuration

Set Parameters of Serial Port 1 (COMA). The screen is shown below.

Serial Port 2 Configuration

Set Parameters of Serial Port 2 (COMB). The screen is shown below.

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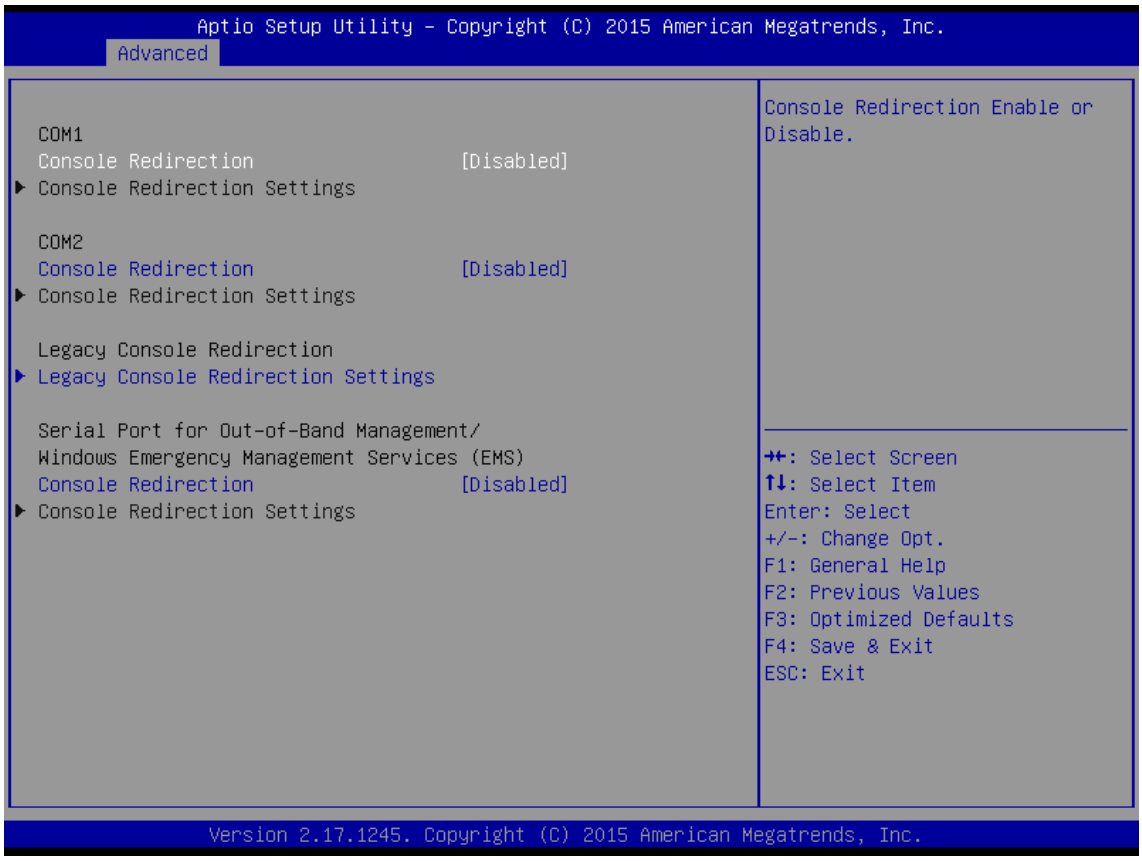
Serial PortGSIO200

Enable or Disable Serial Port (COM). Set this value to **Enabled/Disabled.**

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6.3.3 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 on the following pages. An example of the Serial Port Console Redirection screen is shown below.



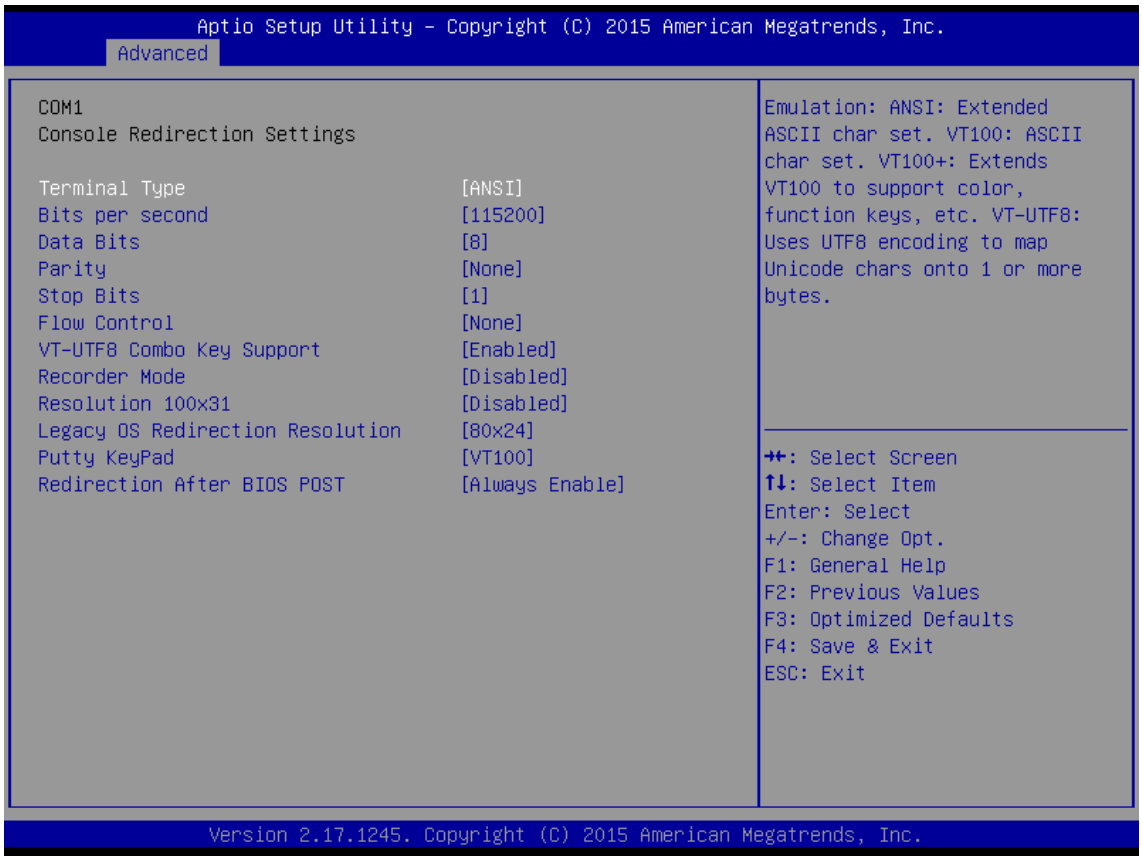
Console Redirection

The BIOS Console Redirection feature here. Set this value to **Enable/Disable**.

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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: **VT100, VT100+, VT-UTF8, ANS**I.

Bits per second

Select the bits per second you want the serial port to use for console redirection. The options are **115200, 57600, 38400, 19200, 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, 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, 2**.

Flow Control

Set this option to select Flow Control for console redirection.
The settings for this value are **None, 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/Disabled**.

Recorder Mode

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

Resolution 100x31

Set this option to extended terminal resolution. Set this value to **Enable/Disable**.

Legacy OS Redirection

On Legacy OS, the number of rows and columns supported 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**.

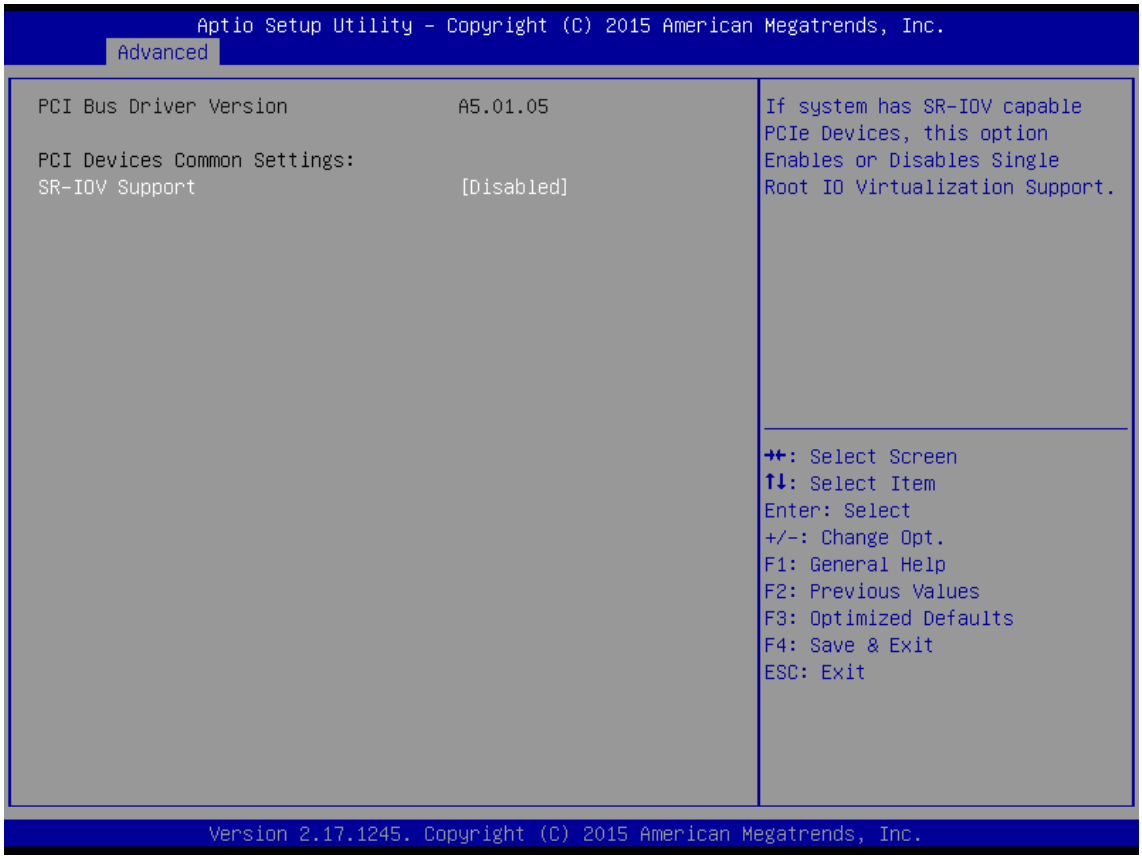
Redirection After BIOS POST

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

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6.3.4 PCI Subsystem Settings

You can use this screen to select options for the PCI Subsystem 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.



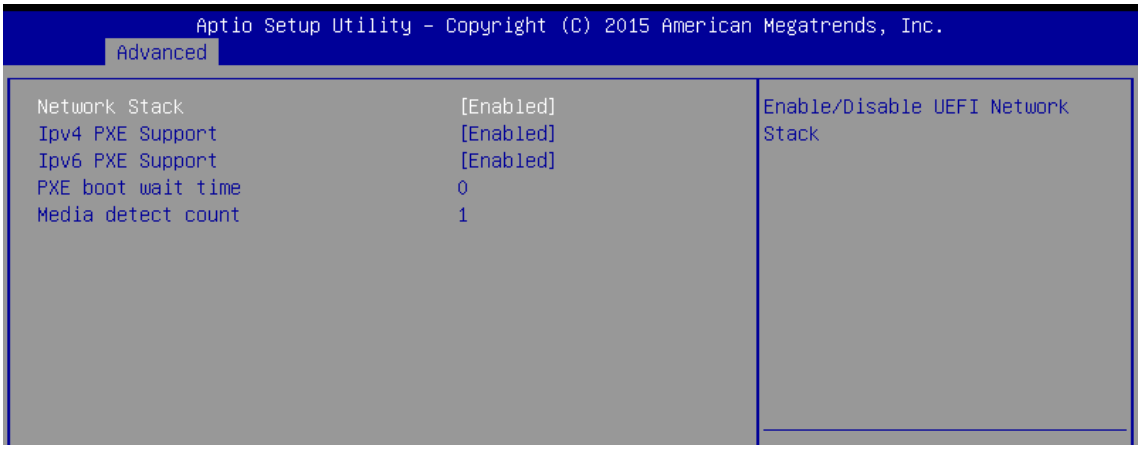
SR-IOV Support

If system has SR-IOV capable PCIe Devices, this option Enables or Disables Single Root IO Virtualization Support. Set this value to **Enabled/Disabled**.

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6.3.5 Network Stack Configuration

You can use this screen to select options for the Network Stack Configuration. 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.



Network Stack

Enable/Disable UEFI Network Stack.
Set this value to **Enabled/Disabled**.

IPv4 PXE Support

Enable Ipv4 PXE Boot Support. If disabled IPV4 PXE boot option will not be created. Set this value to **Enabled/Disabled**.

IPv6 PXE Support

Enable Ipv6 PXE Boot Support. If disabled IPV6 PXE boot option will not be created.
Set this value to **Enabled/Disabled**.

PXE boot wait time

Wait time to press ESC key to abort the PXE boot.
Set this value to **integer**.

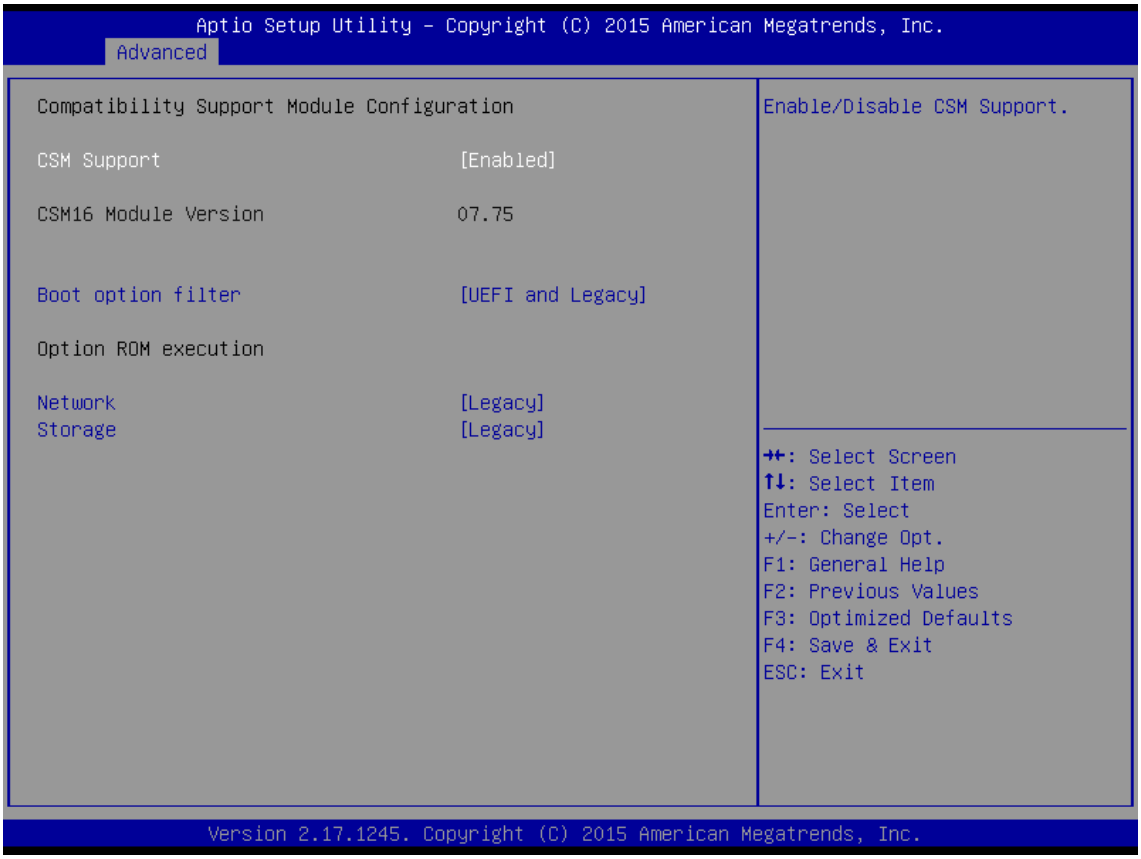
Media detect count

Number of times presence of media will be checked.
Set this value to **integer**.

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6.3.6 CSM Configuration

You can use this screen to select options for the CSM Configuration. 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.



CSM Support

Enable/Disable CSM Support. Set this value to **Enabled/Disabled**.

Boot option filter

This option controls whether to hide Legacy/UEFI boot options. Set this value to **UEFI and Legacy, Legacy only , UEFI only**.

Network

Controls the execution of UEFI and Legacy PXE OpROM. Set this value to **Do not launch, UEFI, Legacy**.

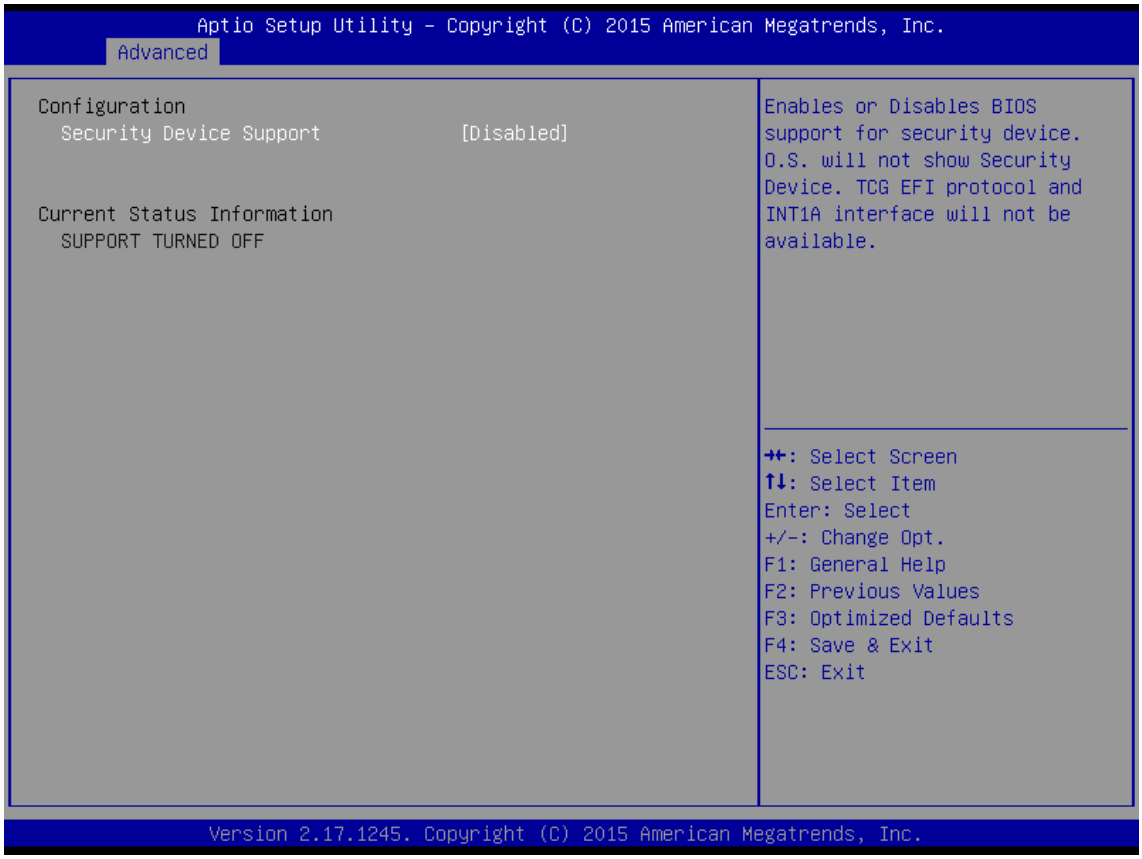
Storage

Controls the execution of UEFI and Legacy PXE OpROM. Set this value to **Do not launch, UEFI, Legacy**

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6.3.7 Trusted Computing

Trusted computing is an industry standard to make personal computers more secure through a dedicated hardware chip, called a Trusted Platform Module (TPM). This option allows enabling or disabling the TPM support.



Security Device Support

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

TPM State

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

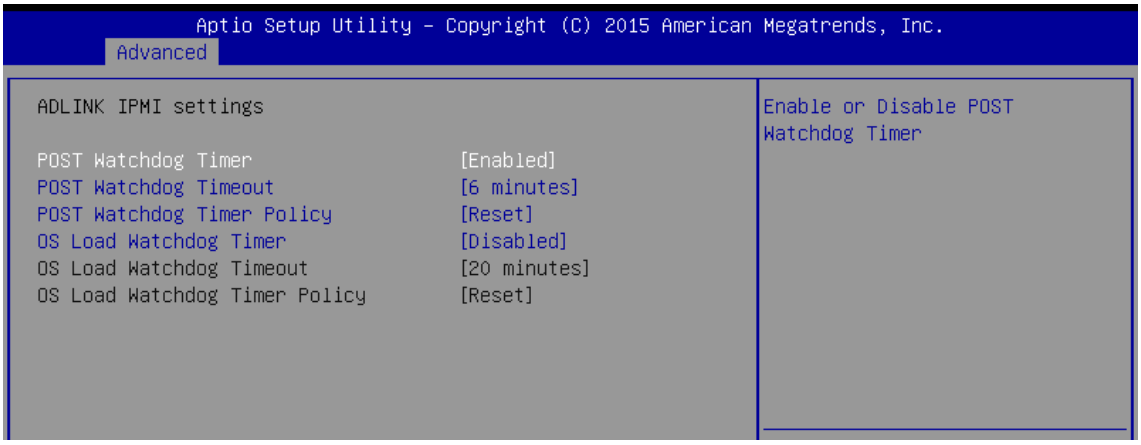
Pending operation

Schedule an Operation for the Security Device. NOTE: your computer will reboot during restart in order to change state of Security Device.

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6.3.8 ADLINK IPMI settings

You can use this screen to select options for the ADLINK IPMI 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.



POST Watchdog Timer

Enable or Disable POST Watchdog Timer. Set this value to **Enabled/Disabled**.

POST Watchdog Timeout

Select the time value for POST Watchdog Timer Expiration value.
Set this value to **3 minutes, 4 minutes, 5 minutes, 6 minutes**.

POST Watchdog Timer Policy

Configure how the system should respond if the POST Watchdog Timer expires. Not available if POST Watchdog Timer is disabled.
Set this value to **Reset, Power Down, Do Nothing**.

OS Load Watchdog Timer

Enable or Disable OS Watchdog Timer. Set this value to **Enabled/Disabled**.

OS Load Watchdog Timeout

Select the time value for OS Watchdog Timer Expiration value.
Set this value to **5 minutes, 10 minutes, 15 minutes, 20 minutes**.

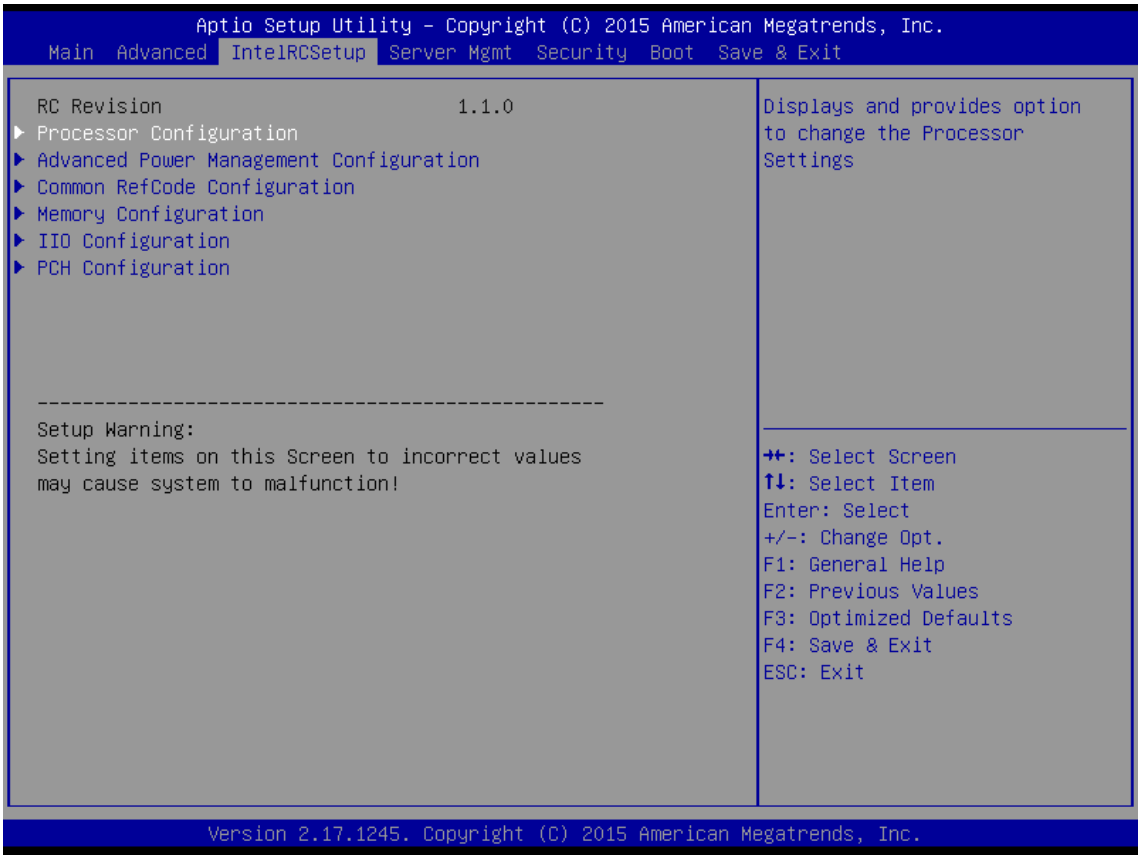
OS Load Watchdog Timer Policy

Configure how the system should respond if the OS Watchdog Timer expires. Not available if OS Watchdog Timer is disabled.
Set this value to **Reset, Power Down, Do Nothing**.

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6.4 Intel RC Setup

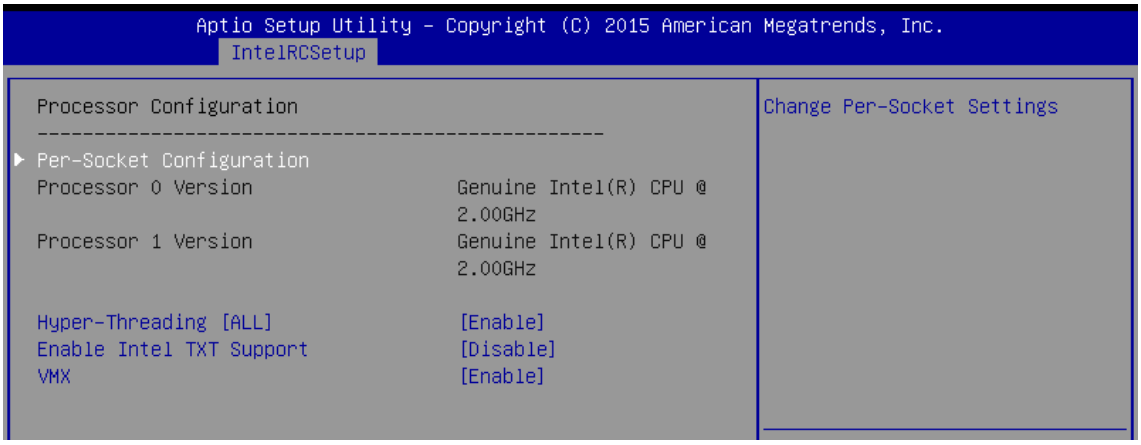
Select the Inte IRC Setup tab from the setup screen to enter the Intel RC Setup screen. You can select any of the items in the left frame of the screen, such as Processor Configuration, to go to the sub menu for that item. You can display an IntelRCSetup option by highlighting it using the < Arrow > keys. The IntelRCSetup screen is shown below.



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6.4.1 Processor Configuration

You can use this screen to select options for the Processor 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.



Hyper-Threading [ALL]

Enables Hyper Threading (Software Method to Enable/Disable Logical Processor threads. Set this value to **Enabled/Disabled**.

Enable Intel TXT Support

Enables Intel Trusted Execution Technology Configuration. Please disable "EV DFX Features" when TXT is enabled. Set this value to **Enabled/Disabled**.

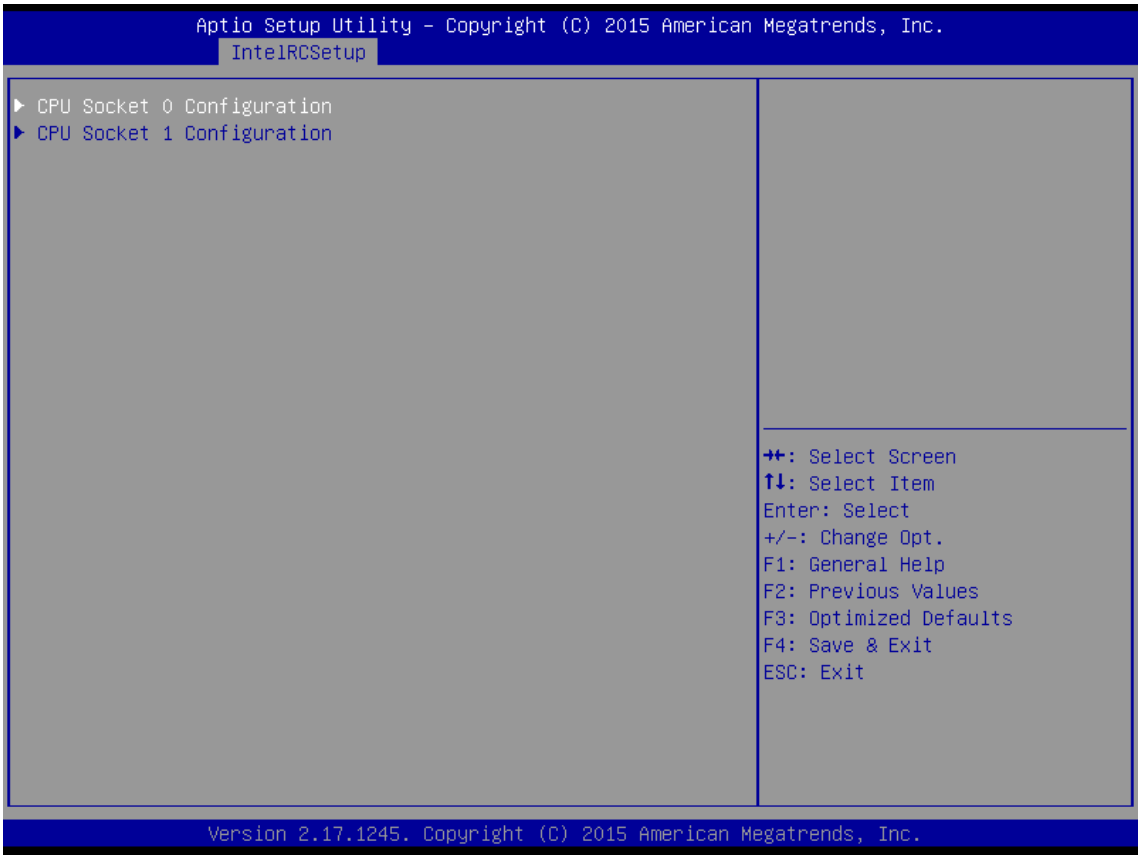
VMX

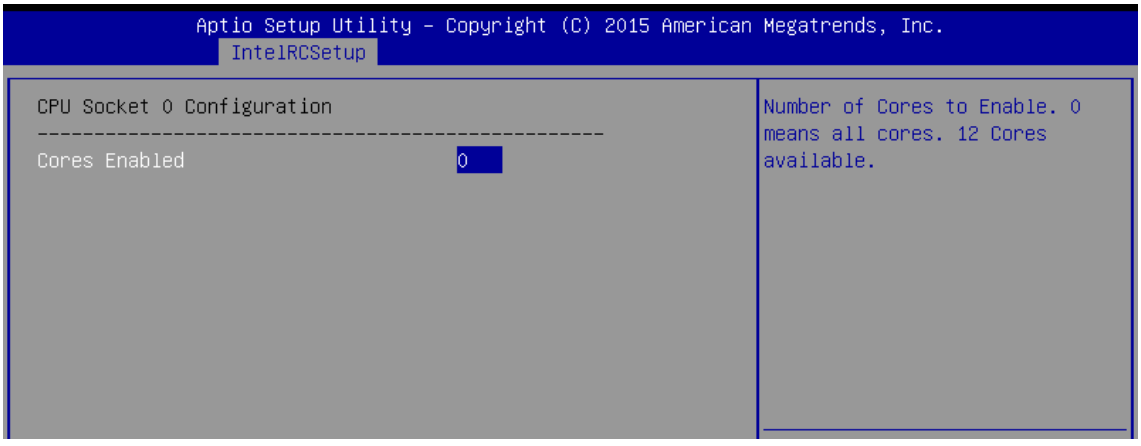
Enables the Vanderpool Technology, takes effect after reboot. Set this value to **Enabled/Disabled**.

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Per-Socket Configuration

Change Per-Socket settings. The screen is shown below





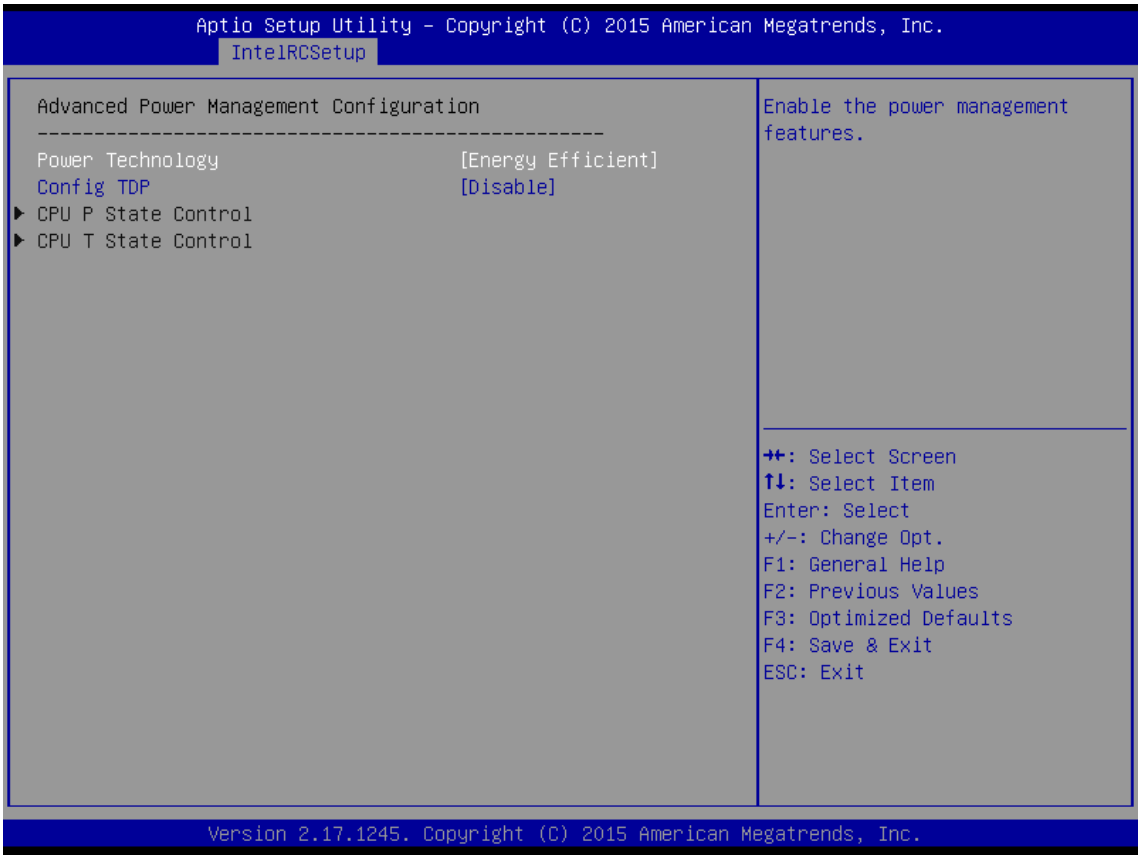
Cores Enabled

Number of Cores to Enable. 0 means all cores.

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6.4.2 Advanced Power Management Configuration

You can use this screen to select options for the Advanced Power Management Configuration. 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



Power Technology

Enable the power management features. Set this value to **Disable/Energy Efficient/Custom**.

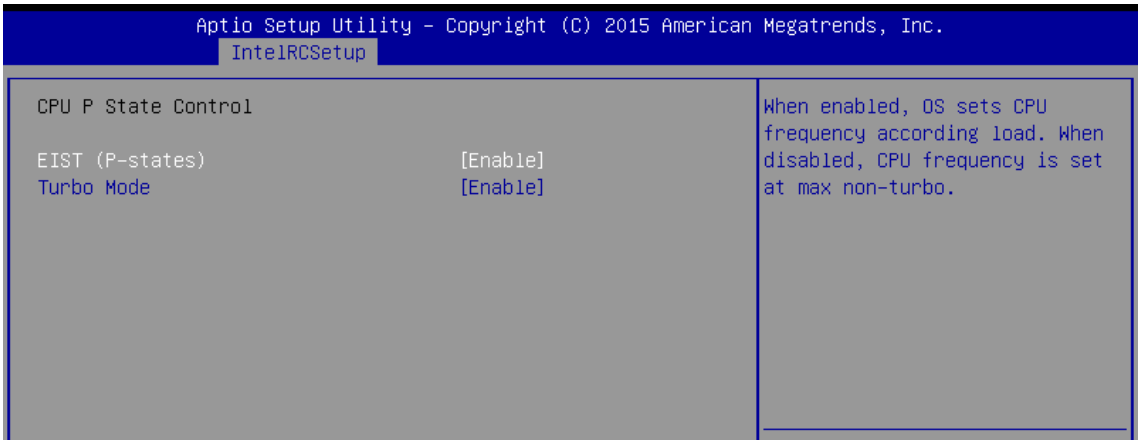
Config TDP

Option to disable/enable Config TDP. Set this value to **Enable/Disable**.

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CPU P State Control

The screen is shown below



EIST (P-states)

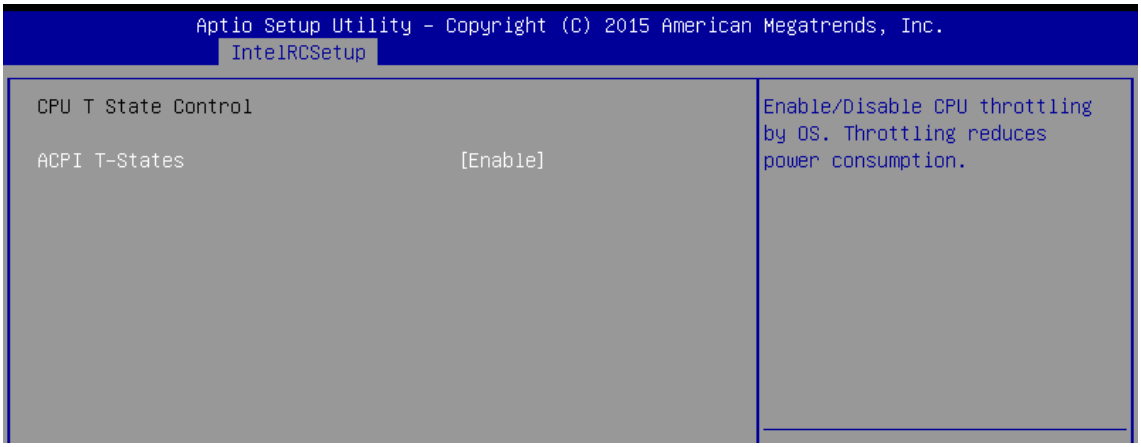
When enabled, OS sets CPU frequency according load. When disabled, CPU frequency is set at max non-turbo. Set this value to **Enable/Disable**.

Turbo Mode

Enable or Disable CPU Turbo mode. Set this value to **Enable/Disable**.

CPU T State Control

The screen is shown below



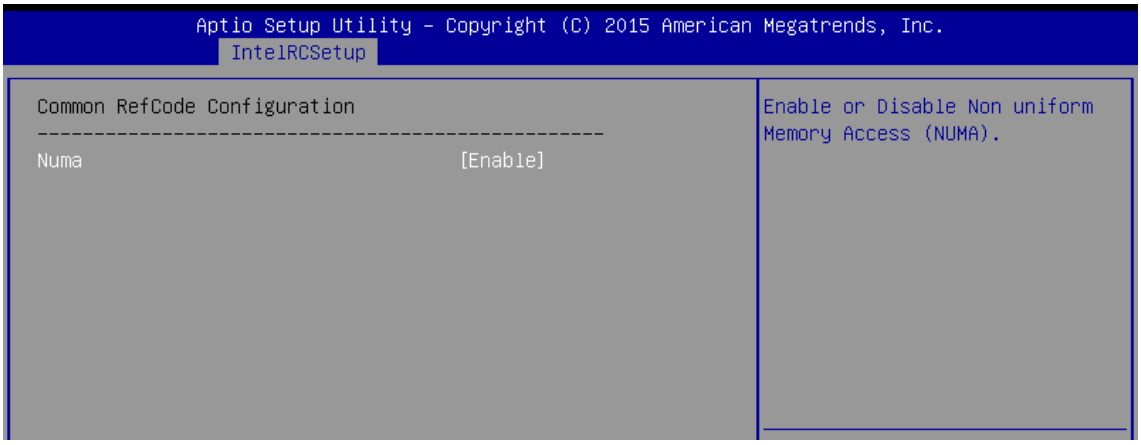
ACPI T-States

Enable/Disable CPU throttling by OS. Throttling reduces power consumption. Set this value to **Enable/Disable.**

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6.4.3 Common RefCode Configuration

You can use this screen to select options for the Common RefCode Configuration. 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.

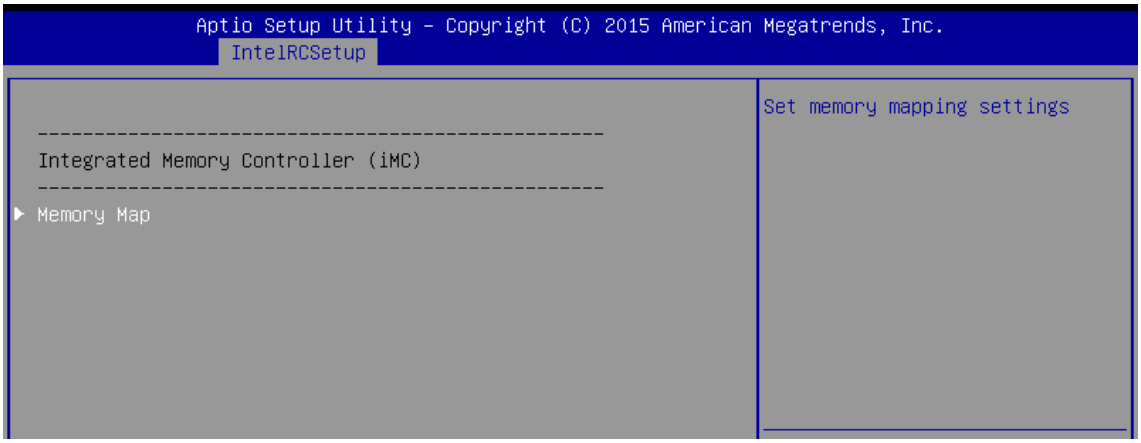


Numa

Enable or Disable Non uniform Memory Access (NUMA). Set this value to **Enable/Disable.**

6.4.4 Memory Configuration

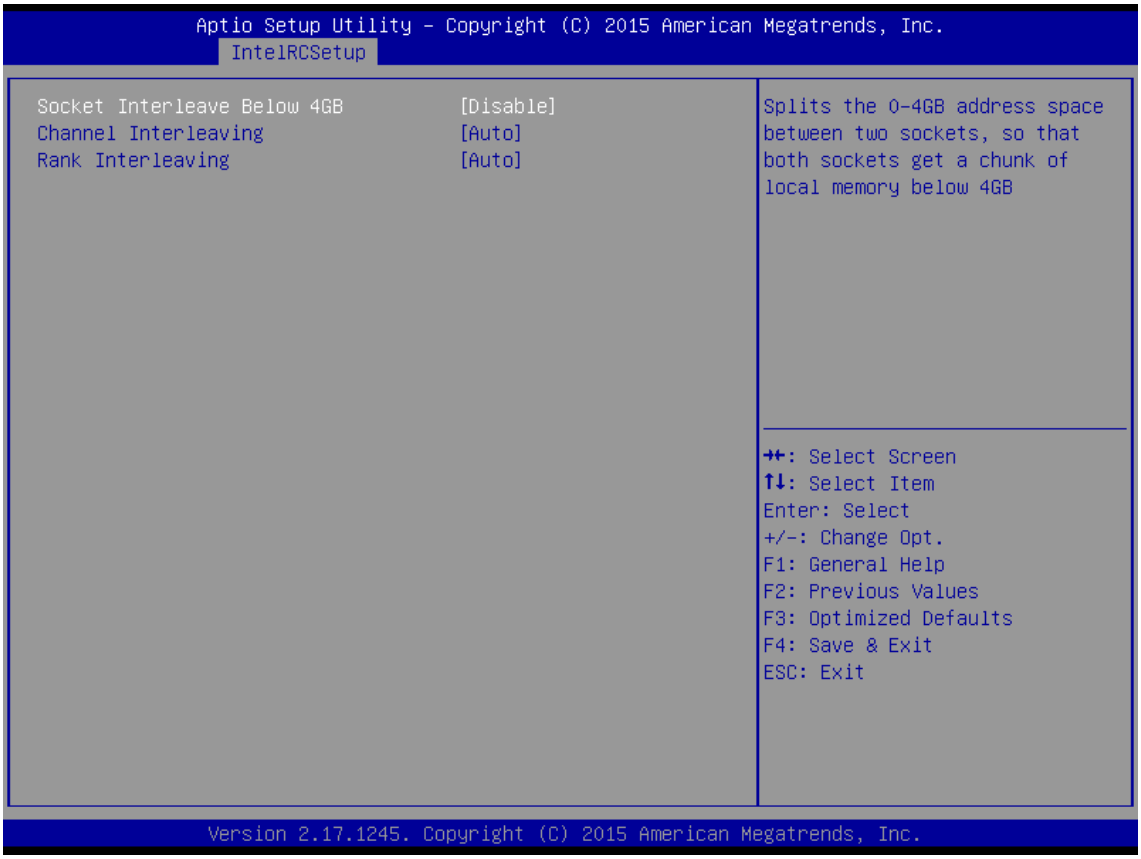
You can use this screen to select options for the Memory Configuration. Use the up and down < Arrow > keys to select an item. Use the < + > and < - > keys to change the value of the selected option. A description of the selected item appears on the right side of the screen. The settings are described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



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Memory Map

Set memory mapping settings. The screen is shown below



Socket Interleave Below 4GB

Splits the 0-4GB address space between two sockets, so that both sockets get a chunk of local memory below 4GB. Set this value to **Enable/Disable.**

Channel Interleaving

Select Channel Interleaving setting. Set this value to Auto/1-way Interleave/2-way Interleave/3-way Interleave/4-way Interleave.

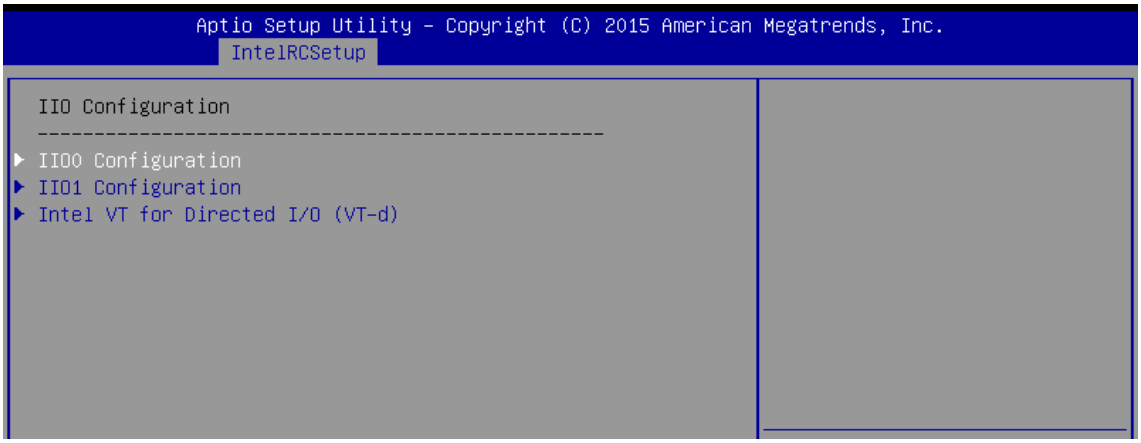
Rank Interleaving

Select Rank Interleaving setting. Set this value to Auto/1-way Interleave/2-way Interleave/4-way Interleave/8-way Interleave.

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6.4.5 IIO Configuration

You can use this screen to select options for the IIO Configuration. 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.



IIO0 Configuration

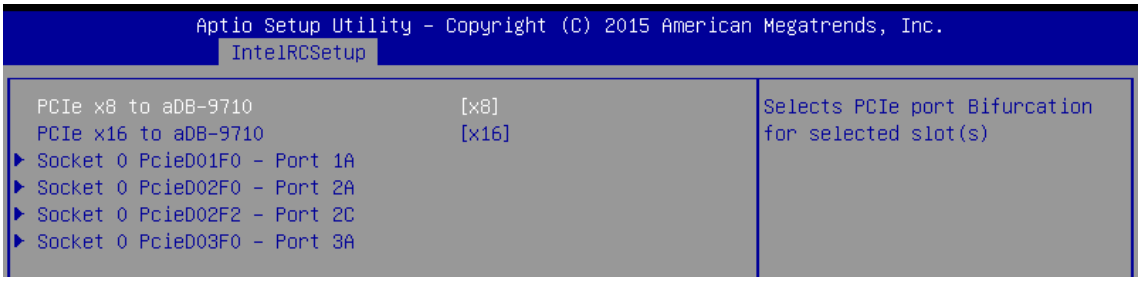
The screen is shown below

IIO1 Configuration

The screen is shown below

Intel VT for Directed I/O (VT-d)

The screen is shown below



PCIe x8 to aDB-9710

Selects PCIe port Bifurcation for selected slot(s). Set this value to **Auto/x8/x4x4.**

PCIe x16 to aDB-9710

Selects PCIe port Bifurcation for selected slot(s). Set this value to **Auto/ x16/ x8x8/ x8x4x4/ x4x4x8/ x4x4x4x4.**

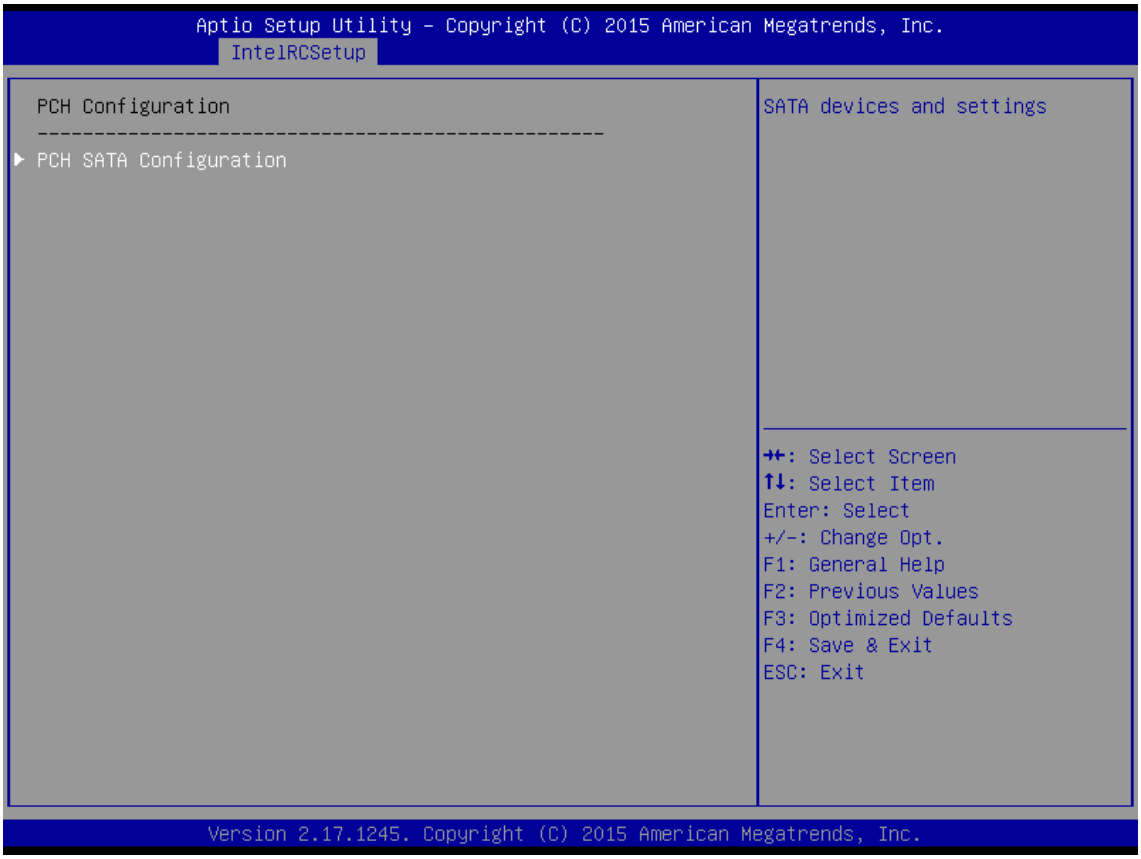
Socket 0 PcieD0xFx - Port xx

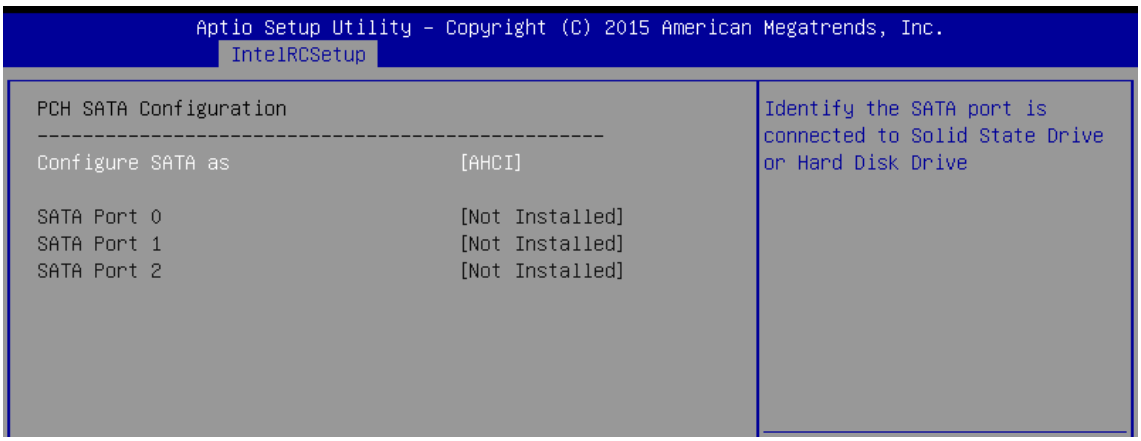
Settings related to PCI Express Ports (0/1A/1B/2A/2B/2C/2D/3A/3B/3C/3D/).The screen is shown below

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6.4.6 PCH Configuration

You can use this screen to select options for the PCH Configuration. 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.





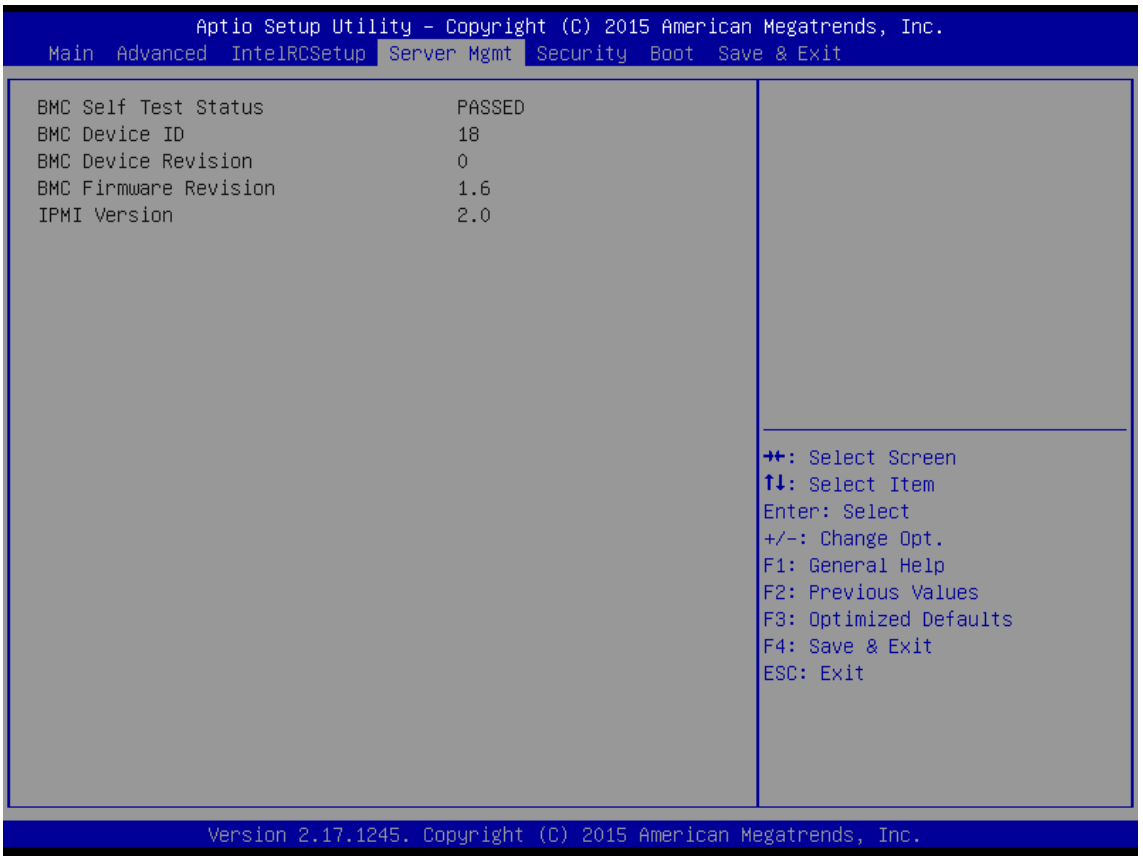
Configure SATA as

This will configure SATA as IDE, RAID or AHCI. Set this value to **IDE/AHCI/ RAID**.

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6.5 Server Mgmt Setup Screen

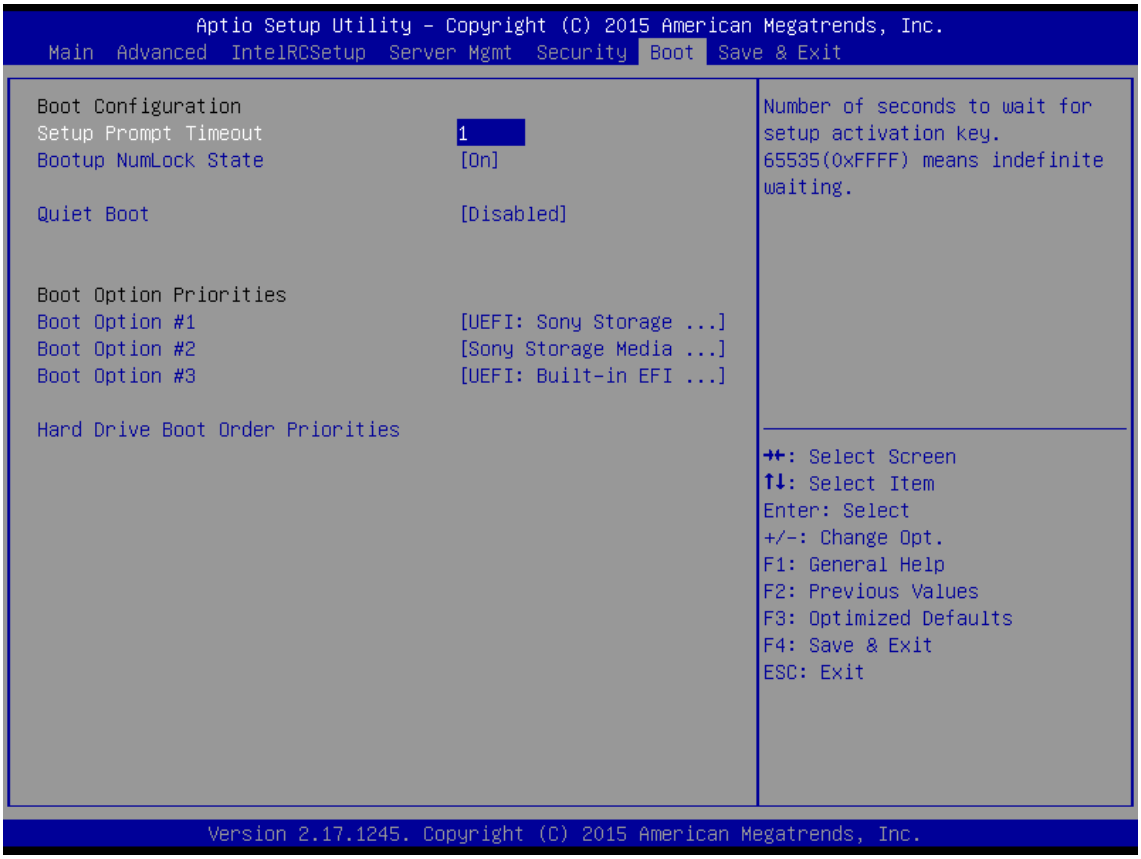
You can use this screen to specify options for the Server Management settings. Use the up and down <Arrow> keys to select an item. Use <+> and <-> keys to change the value of the selected option. The settings are described in the following pages. The screen is shown as below.



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6.6 Boot Setup Screen

You can use this screen to specify options for the Boot 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. The settings are described in the following pages. The screen is shown as the below.



Setup Prompt Timeout

It's the number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting. Use the <+> and <-> keys to change the value of this item.

Quiet Boot

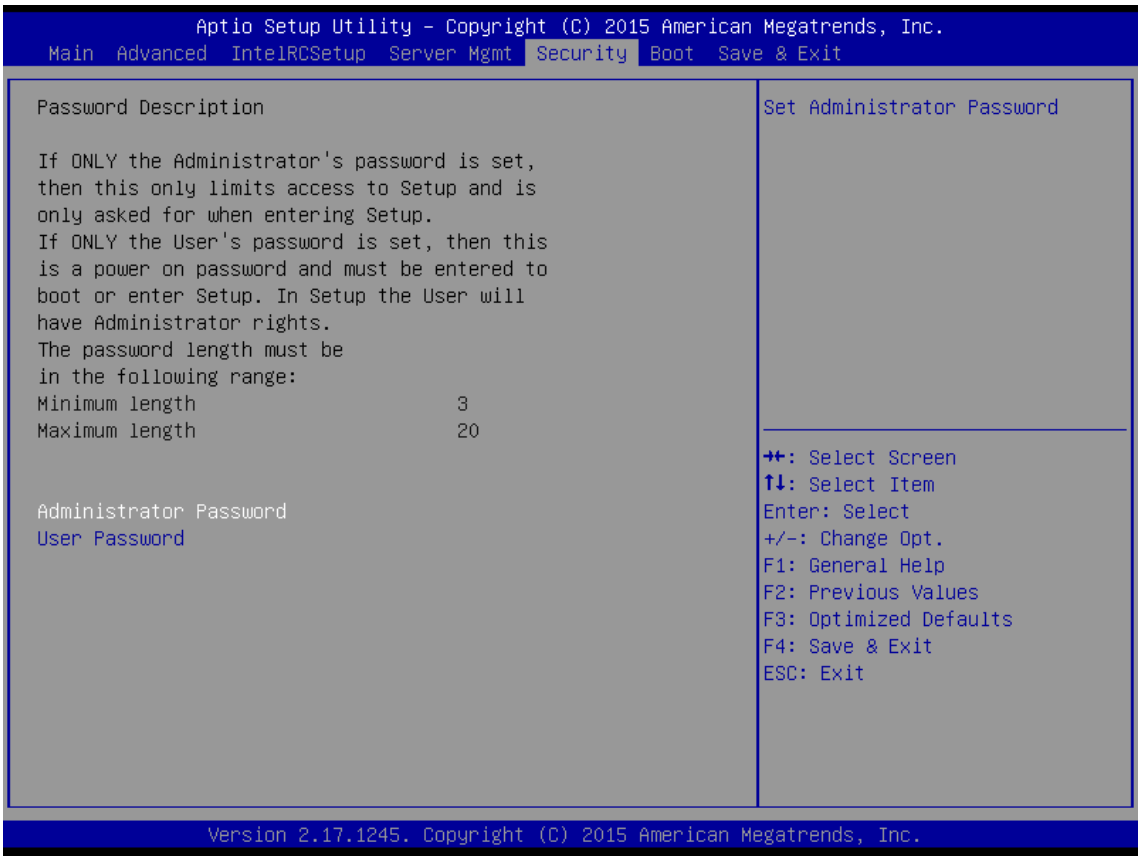
This item allows system BIOS to show the boot up splash logo. When it is set to "Enabled", the logo that in system BIOS will be shown during display outputs.

Boot Option Priorities

It shows the boot priority of boot devices. User can adjust the order to make customized boot priority of found bootable devices.

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6.7 Security Setup Screen



System BIOS provides two levels of password protection. They are Administrator password and User password. The system can be configured that all users must enter password every time the system boots or when setup utility is executed, using either Administrator password or User password.

The Administrator and User passwords activate two different levels of password security. If you select password support, you are prompted for 3 to 20 characters password. Type the password on the keyboard. The password doesn't appear on the screen when typed. Make sure you write it down. If you forget it, you must drain NVRAM and re-configure it.

Administrator Password

Use this option to set a password for administrator with full control of the BIOS setup utility.

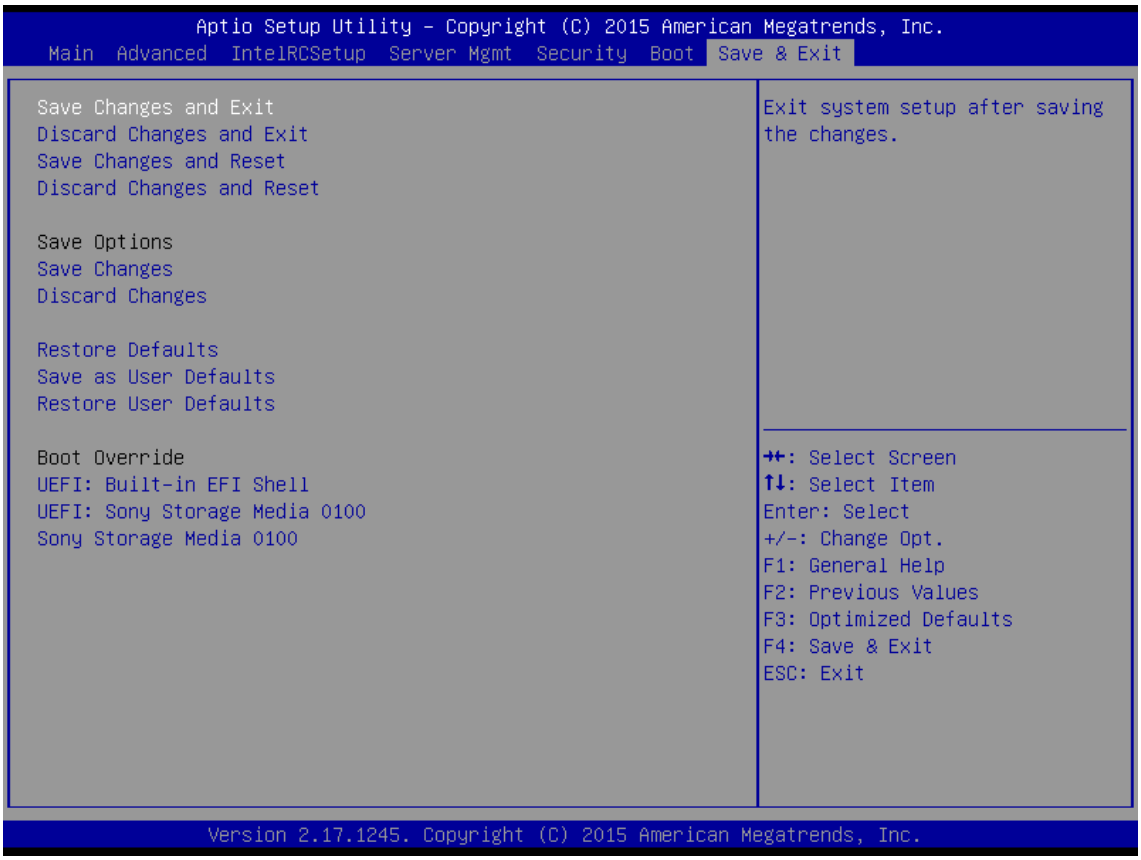
User Password

Use this option to set a password for user with limited access to the BIOS setup utility.

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6.8 Save & Exit Setup Screen

Select ***Save & Exit*** tab from setup utility to enter ***Save & Exit*** BIOS setup screen. You can select an item by highlighting it using the <Arrow> keys. The ***Save & Exit*** BIOS setup screen is shown below.



Save Changes and Exit

When you have completed the system configuration changes, select this option to leave setup utility and reboot the computer to let new system configuration parameters can take effect. When selecting this item and then press <Enter>. The below message will be shown up and wait for the confirmation.

Save Changes and Exit?
[OK] [Cancel]

Select OK and press <Enter> to save changes and exit. It will keep booting the system to OS if no changes need to reset system.

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Discard Changes and Exit

Select this option to quit setup without making any permanent changes to the system configuration. When selecting this item and then press <Enter>. The below message will be shown up and wait for the confirmation.

Discard Changes and Exit?
[OK] [Cancel]

Select OK and press <Enter> to discard changes and exit. It will keep booting the system to OS.

Save Changes and Reset

It has the same function as Save Changes and Exit except resetting system. System will always be reset after selecting this item no matter what change is made,

Discard Changes and Reset

It has the same function as Discard Changes and Exit except resetting system. System will always be reset after selecting this item and will not save any configuration.

Save Changes

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

Discard Options

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

Restore Defaults

Load BIOS built-in default value for all setup options.

Save as User Defaults

Save the changes done so far as user defaults.

Restore User Defaults

Restore the saved user default to all the setup options.

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7 Serial Over LAN

Serial Over LAN (SOL) is a remote management feature that allows the IPMC (Smart Fusion A2F500) to redirect the serial console from the blade via an IPMI session over the network with RMCP+ protocol.

The aTCA-9710 supports SOL on the Base Interface which is powered by the Intel 82576 Gigabit Ethernet Controller. The Intel 82576 Gigabit Ethernet Controller is connected to the IPMC (Smart Fusion A2F500) via the NC-SI interface, which provides remote management capability before the payload power is authorized. Users can use the SOL feature to transmit/receive serial console message from a remote site with full console management functionality.

The aTCA-9710 supports 2 channels (channel 1/2) and 2 user IDs for SOL. You can refer to the following sections for more detailed information.

Note: SOL does not support simultaneous login of more than one user.

7.1 Preparation For SOL Connection

First of all, you need to prepare a remote client with Linux OS and connect to the network.

7.2 Configure The Remote Client

7.2.1 Install IPMItool For The Remote Client

You can download the latest IPMItool and document from the following website http://IPMItool.sourceforge.net

Click on either the *bz or *gz version of IPMItool to download the bzipped or gzipped IPMItool source code tarball respectively.

To build IPMItool, unzip and untar the downloaded IPMItool package, configure IPMItool for your system, and change to the created IPMItool directory to build IPMItool.

Example using the gzipped tarball:

```
tar xvzf IPMItool*.tar.gz  cd IPMItool*
```

Run the following to configure IPMItool for your system:

```
./configure
```


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Build the source code and install IPMItool:

```
make
make install
```

Now your remote client is ready to connect to the target the aTCA-9710.

Note: The install must be run with root permissions to overlay the existing IPMItool utility in /usr/local/bin.

7.3 Configure the Target aTCA-9710

7.3.1 BIOS Configurations

You can refer to section 6.3.3 to enable Serial Port Console Redirection on COM1.

Note: The aTCA-9710 supports SOL on COM1 only

7.3.2 Linux GRUB Settings

GRUB supports sending its messages to the serial console. The following lines should be added to the top of the /boot/grub/grub.conf file.

```
default=1
timeout=5
serial --unit=1 --speed=115200 --word=8 --parity=no --stop=1
terminal --timeout=15 serial console
```

The following parameters need to be passed to each instance of the Linux kernel. They should be added to the kernel line.

```
console=tty0 console=ttyS1,115200n8
```

An example is shown below:

```
title SOL (2.6.18-128.el5)
root (hd0,0)
kernel /boot/vmlinuz-2.6.18-128.el5 ro root=LABEL=/ console=tty0
console=ttyS1,115200n8
initrd /boot/initrd-2.6.18-128.el5.img
```


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7.3.3 Linux System Setting

Linux needs to be told to listen for logins on the serial port. This is done by adding the following line to /etc/inittab.

Add the following line to the init configuration file /etc/inittab.

s1:12345:respawn:/sbin/agetty –L ttyS1 115200 vt100

Now the target aTCA-9710 is ready for SOL connection.

7.4 Establish SOL Connection

Execute the following command from your remote client to establish the SOL Connection Command:

ipmitool -I lanplus -H <Target IPMC IP > -C < Cipher Suite Id > -U <User Name> -P <Password> sol activate

Note: Please refer to the following table for the Cipher Suite Id

ID	Characteristics	Cipher Suite	Authentication Algorithm	Integrity Algorithm(s)	Confidentiality Algorithm(s)
0	“straight password"	00h, 00h, 00h	RAKP-none	None	None
1	S	01h, 00h, 00h	RAKP-HMAC-SHA1	None	None
2	S, A	01h, 01h, 00h		HMAC-SHA1-96	None
3	S, A, E	01h, 01h, 01h			AES-CBC-128
4	S, A, E	01h, 01h, 02h			xRC4-128
5	S, A, E	01h, 01h, 03h			xRC4-40
6	S	02h, 00h, 00h	RAKP-HMAC-MD5	None	None
7	S, A	02h, 02h, 00h		HMAC-MD5-128	None
8	S, A, E	02h, 02h, 01h			AES-CBC-128
9	S, A, E	02h, 02h, 02h			xRC4-128
10	S, A, E	02h, 02h, 03h			xRC4-40
11	S, A	02h, 03h, 00h		MD5-128	None
12	S, A, E	02h, 03h, 01h			AES-CBC-128
13	S, A, E	02h, 03h, 02h			xRC4-128
14	S, A, E	02h, 03h, 03h			xRC4-40
80h-BFh	OEM specified	OEM specified	OEM specified	OEM specified	OEM specified
C0h-FFh	reserved	-	-	-	-

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The default values of the aTCA-9710 SOL parameters are listed in the table below

Parameter	Default Value
Channel 1 IP Address	172.17.172.134
Channel 2 IP Address	172.17.172.135
User ID	2
User Name	adlinkuser
Password	adlinkuser

Below are 2 samples to establish the SOL session via channel 1 with default user name and password:

Sample:

Establish a non-nncrypted RMCP+ SOL session

```
./ipmitool -I lanplus -H 172.17.172.134 -C 0 -U "adlinkuser" -P "adlinkuser" sol activate
```

Establish an encrypted RMCP+ SOL session

```
./ipmitool -I lanplus -H 172.17.172.134 -C 3 -k gkey -U "adlinkuser" -P "adlinkuser" sol activate
```

For more details on IPMI commands, please visit the following site: http://ipmitool.sourceforge.net.

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8 Drivers

The drivers for aTCA-9710 are available on the ADLINK website. Please visit the aTCA-9710 product web site for more details: www.adlinktech.com

We recommend using all the drivers provided on the ADLINK website to ensure driver compatibility. Contact ADLINK to get support for other operating system..

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Safety Instructions

1. Please read these safety instructions carefully.
2. Please keep this User‘s Manual for later reference.
3. One AC Inlets provided and service as Disconnect Devices, disconnect the equipment from both AC outlets use these AC Inlets before servicing or clearing. Use moisture sheet or cloth for cleaning.
4. For pluggable equipment, that the socket-outlet shall be installed near the equipment and shall be easily accessible.
5. Please keep this equipment from humidity.
6. Lay this equipment on a reliable surface when install. A drop or fall could cause injury.
7. Make sure the voltage of the power source when connect the equipment to the power outlet.
8. Place the power cord such a way that people can not step on it. Do not place anything over the power cord.
9. All cautions and warnings on the equipment should be noted.
10. If the equipment is not use for long time, disconnect the equipment from mains to avoid being damaged by transient overvoltage.
11. Never pour any liquid into openings; this could cause fire or electrical shock.
12. Never open the equipment. For safety reason, the equipment should only be opened by qualified service personnel.
13. If one of the following situations arises, get the equipment checked by a service personnel:
    a. The Power cord or plug is damaged.
    b. Liquid has penetrated into the equipment.
    c. The equipment has been exposed to moisture.
    d. The equipment has not work well or you can not get it work according to user‘s manual.
    e. The equipment has dropped and damaged.
    f. If the equipment has obvious sign of breakage.
14. The equipment can be operated at an ambient temperature of 55°C.
15. Lithium Battery provided (real time clock battery), contact ADLINK for replacement.

CAUTION – Risk of explosion if battery is replaced by one of an incorrect type. Dispose of used batteries according to the instructions.

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Getting Service

Ask an Expert: http://askanexpert.adlinktech.com

ADLINK Technology, Inc.
Address: 9F, No.166 Jian Yi Road, Zhonghe District
New Taipei City 235, Taiwan
新北市中和區建一路 166 號 9 樓
Tel: +886-2-8226-5877
Fax: +886-2-8226-5717
Email: service@adlinktech.com

Ampro ADLINK Technology, Inc.
Address: 5215 Hellyer Avenue, #110, San Jose, CA 95138, USA
Tel: +1-408-360-0200
Toll Free: +1-800-966-5200 (USA only)
Fax: +1-408-360-0222
Email: info@adlinktech.com

ADLINK Technology (China) Co., Ltd.
Address: 上海市浦东新区张江高科技园区芳春路 300 号 (201203)
300 Fang Chun Rd., Zhangjiang Hi-Tech Park, Pudong New Area
Shanghai, 201203 China
Tel: +86-21-5132-8988
Fax: +86-21-5132-3588
Email: market@adlinktech.com

ADLINK Technology GmbH
Address: Hans-Thoma-Strasse 11, D-68163, Mannheim, Germany
Tel: +49-621-43214-0
Fax: +49-621 43214-30
Email: emea@adlinktech.com

Please visit the Contact page at www.adlinktech.com for information on how to contact the ADLINK regional office nearest you.

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