

MECS-6110/6111

**1U Edge Server
with Intel® Xeon® D Processor**

User's Manual



Manual Rev.:	Rev. 1.4
Revision Date:	February 24, 2023
Part No.:	50M-00037-1040

Preface

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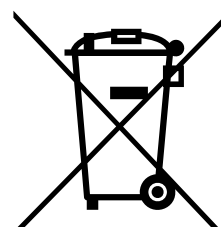
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Revision History

Revision	Release Date	Description of Change(s)
1.0	2021-08-19	Initial release
1.1	2021-10-18	Update BMC eth0/1 IP settings; add BIOS Server Mgmt Settings
1.2	2022-02-21	Correct formatting errors
1.3	2023-02-01	Correct board layout BIOS SPI flash locations
1.4	2023-02-24	Add power and reset button descriptions

Conventions



Information to prevent minor physical injury, component damage, data loss, and/or program corruption when trying to complete a task.

Informations destinées à prévenir les blessures corporelles mineures, les dommages aux composants, la perte de données et/ou la corruption de programme lors de l'exécution d'une tâche.



Information to prevent serious physical injury, component damage, data loss, and/or program corruption when trying to complete a specific task.

Informations destinées à prévenir les blessures corporelles graves, les dommages aux composants, la perte de données et/ou la corruption de programme lors de l'exécution d'une tâche spécifique.

Table of Contents

Preface	2
1 Overview	6
1.1 Introduction	6
1.2 Block Diagram.....	7
1.3 Mechanical Overview	8
1.3.1 MECS-6110 Front Panel.....	8
1.3.2 MECS-6111 Front Panel.....	8
1.3.3 MECS-6110 Rear Panel	9
1.3.4 MECS-6111 Rear Panel.....	9
1.3.5 MECS-6110 Internal Layout	10
1.3.6 MECS-6111 Internal Layout.....	11
1.4 Mechanical Dimensions	12
2 Specifications	13
2.1 MECS-6110 Specifications.....	13
3 Getting Started.....	15
3.1 Removing the Chassis Cover	15
3.2 Installing Memory Modules	16
3.3 PCIe Card Installation	17
3.4 PCIe Slot Secondary Power Supply	23
3.5 Rails Assembly and Rack Installation	24
3.6 Remove the Chassis from the Rack	28
3.7 Connecting the System to Ground	29
3.8 System Power Cable Installation	30
3.9 Login to the BMC via Console Port.....	31
3.10 Login to the BMC via Network	33
3.11 BMC eth0 Default and Static IP Settings.....	35
3.12 BMC eth1 Default and Static IP Settings.....	36
3.13 BIOS Update	37
3.13.1 Updating the BIOS via Network with BMC Tool.....	37
3.13.2 Updating BIOS via Host with BIOS Tool.....	38
3.14 BMC Firmware Update via Network.....	39
3.15 BMC Firmware Update via Host with Yafuflash	40
3.16 Enter BIOS Setup	41
3.17 Clear CMOS.....	41
4 System Interfaces.....	42
4.1 Front Panel I/O.....	42
4.2 Status LEDs and Buttons	43
4.3 LAN Ports.....	44
4.4 SFP+ Ports.....	45
4.5 Dual USB 3.0 and RJ-45 Console Port.....	46
4.6 1PPS/TOD Connector.....	47
4.7 HDD/User LED Jumper.....	48
4.8 User LED Commands	48
4.8.1 OEM ADLINK Set LED Status	48
4.8.2 OEM ADLINK Get LED Status.....	49
4.9 Board Layout.....	50

5 BIOS Setup.....	52
5.1 BIOS Setup Menu	52
5.1.1 Menu Selection Bar	52
5.1.2 Menu Conventions.....	53
5.2 Main Menu	53
5.2.1 BIOS Information	54
5.2.2 System Information.....	54
5.3 Advanced Menu	55
5.3.1 Sub-Menu: Trusted Computing.....	56
5.3.2 Sub-Menu: AST2500 Super IO Configuration	57
5.3.3 Sub-Menu: Serial Port Console Redirection.....	58
5.3.4 Sub-Menu: PCI Subsystem Settings	60
5.3.5 Sub-Menu: Network Stack Configuration	61
5.3.6 Sub-Menu: CSM Configuration.....	62
5.3.7 Sub-Menu: NVMe Configuration.....	63
5.3.8 Sub-Menu: OEM IPMI Settings	64
5.3.9 Sub-Menu: Intel(R) I210 Gigabit Network Connection	65
5.3.10 Sub-Menu: Intel(R) Ethernet Connection X722 for 10GbE	66
5.4 Chipset Menu	67
5.4.1 System Agent (SA) Configuration.....	67
5.4.2 Sub-Menu: CPU Configuration	68
5.4.3 Sub-Menu: Memory Configuration.....	69
5.4.4 Sub-Menu: IIO Configuration.....	71
5.4.5 Sub-Menu: Intel(R) VT for Directed I/O (vt-d).....	74
5.4.6 PCH-IO Configuration.....	75
5.4.7 Sub-Menu: PCH Configuration	75
5.4.8 Sub-Menu: Server ME Information	78
5.5 Security Menu	79
5.6 Boot Menu.....	80
5.7 Save & Exit Menu	81
5.8 Server Mgmt Menu	82
5.8.1 Sub-Menu: System Event Log.....	83
5.8.2 Sub-Menu: BMC Self-test Log.....	84
5.8.3 Sub-Menu: BMC Network Configuration	85
5.8.4 Sub-Menu: BMC User Settings	86
Important Safety Instructions.....	90
Consignes de Sécurité Importantes	92
Getting Service	94

1 Overview

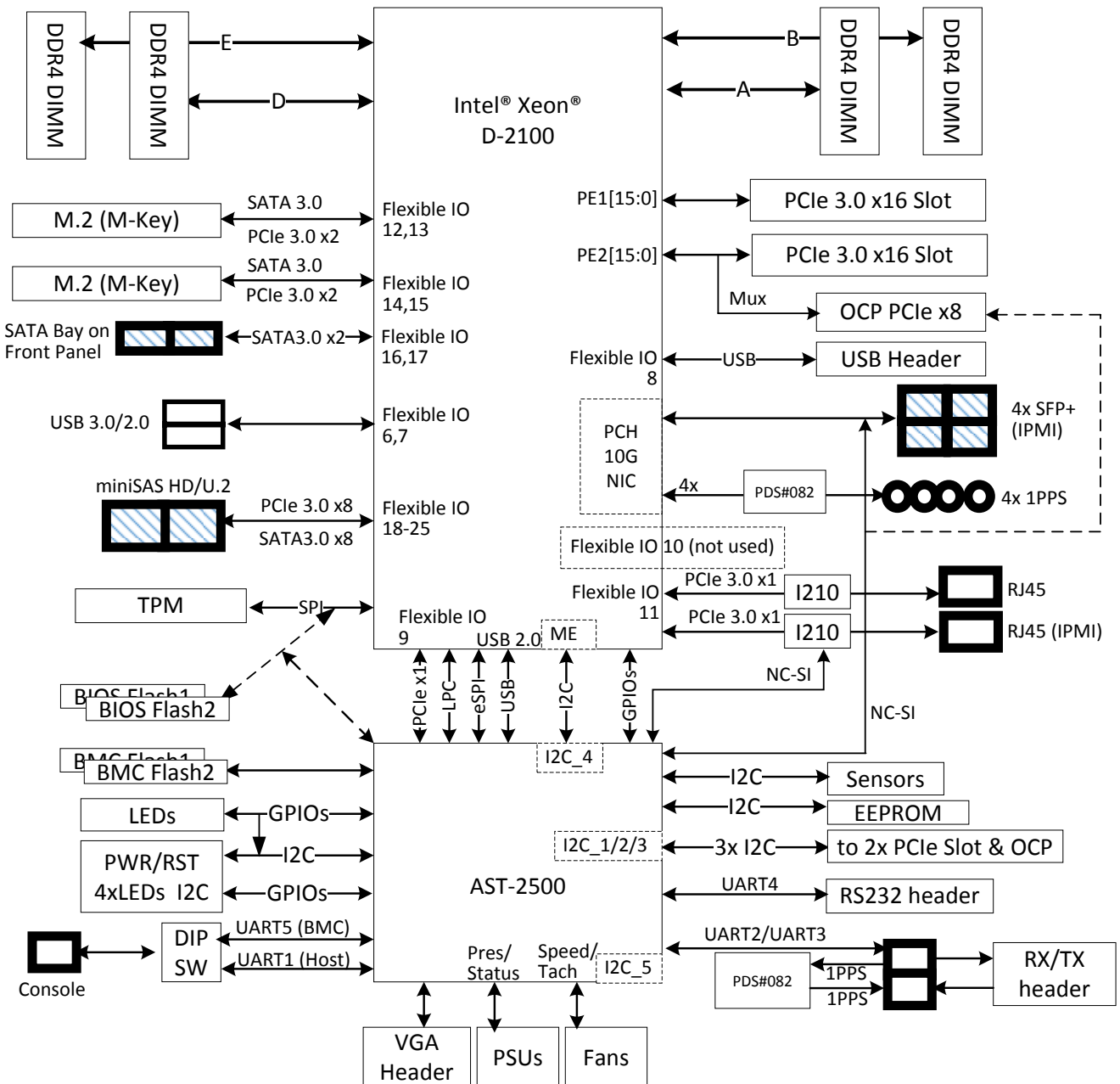
1.1 Introduction

The ADLINK MECS-6110 is a 1U 19" rackmount edge computing server with Intel® Xeon® processor System-on-Chip. The MECS-6110 features an IO intensive architecture with up to 2x PCIe x16 FHFL interfaces, 2x 2.5" SATA drive bays, 4x SFP+ ports. It also features IEEE 1588v2 Precision Time Protocol (PTP) and is an ideal platform for 5G mobile edge computing infrastructure deployment.

The main features of the MECS-6110 as follows:

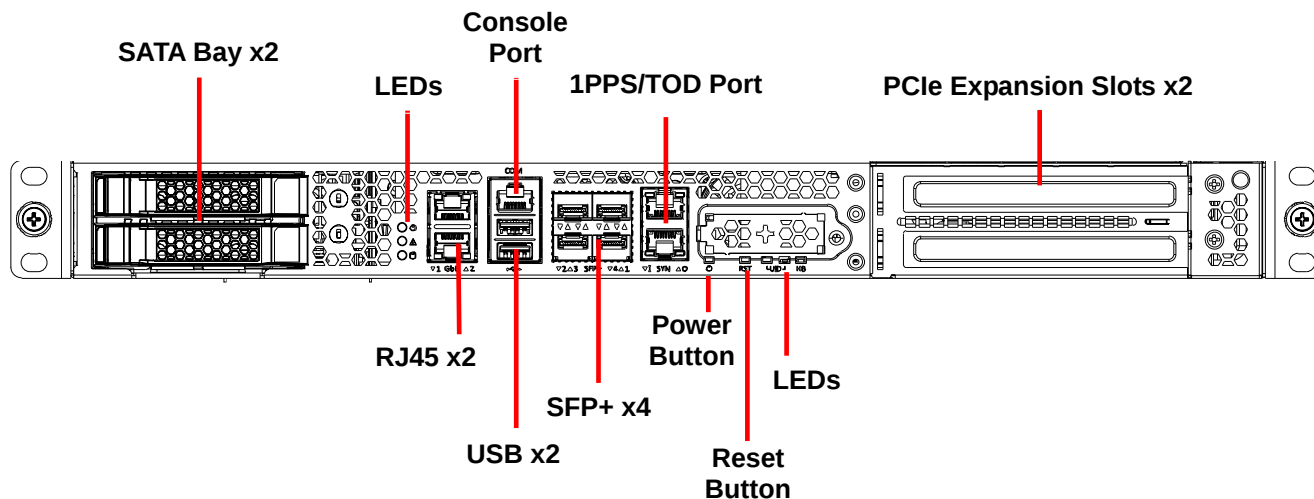
- 1x Intel® Xeon® D-2100 family processor
- 4x DDR4-2666 RDIMM ECC REG up to 256GB
- 2x 2.5" SATA bays (only for MECS-6110) and 2x M.2 M Key interfaces
- 2x PCIe x16 Gen3 single-slot FHFL interfaces or 1x PCIe x16 Gen3 dual-slot FHFL interface
- 1x PCIe x8 Gen3 OCP interface
- 420mm depth 1U 19" rackmount form factor
- Built-in Intel® QAT support
- TPM 1.2/2.0 module
- 2x IEEE 1588 v2 1PPS/TOD RJ-45 port and 4x 1PPS MMCX input/output
- EMC grade: Class B
- PSUs front accessible for small footprint deployment (MECS-6111 only)

1.2 Block Diagram

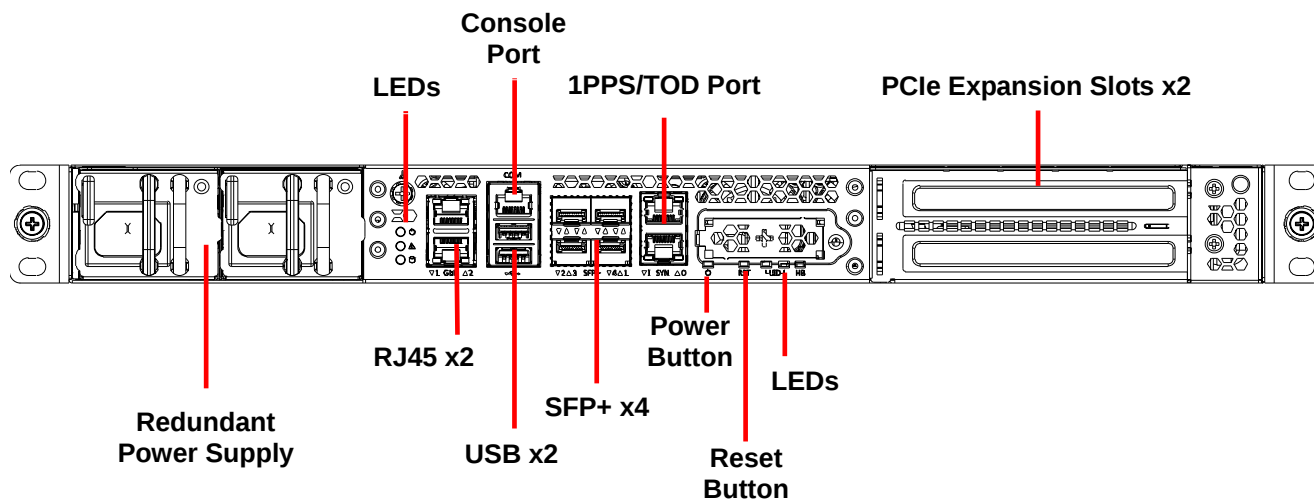


1.3 Mechanical Overview

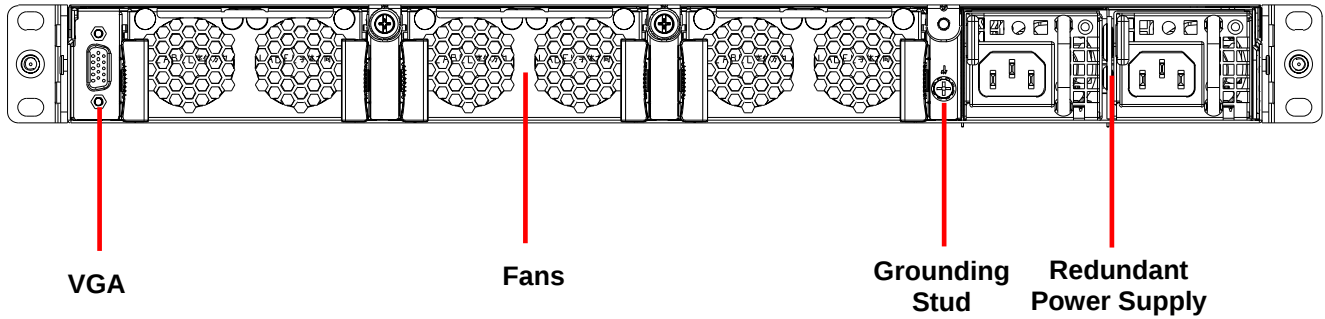
1.3.1 MECS-6110 Front Panel



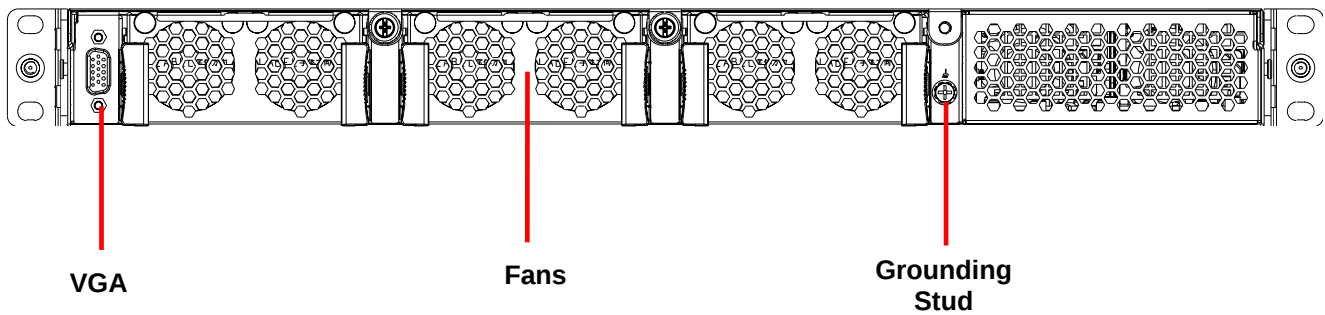
1.3.2 MECS-6111 Front Panel



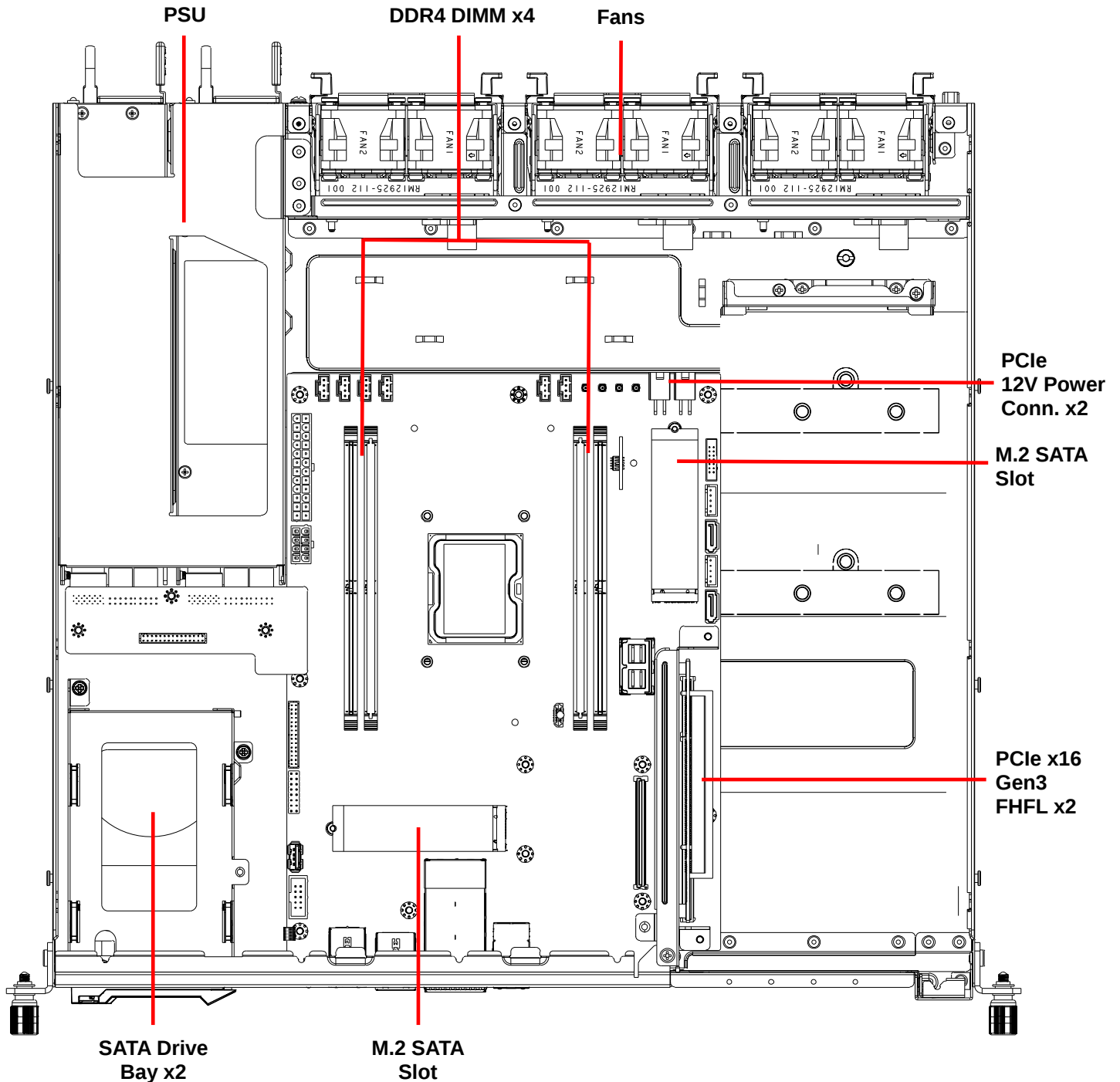
1.3.3 MECS-6110 Rear Panel



1.3.4 MECS-6111 Rear Panel

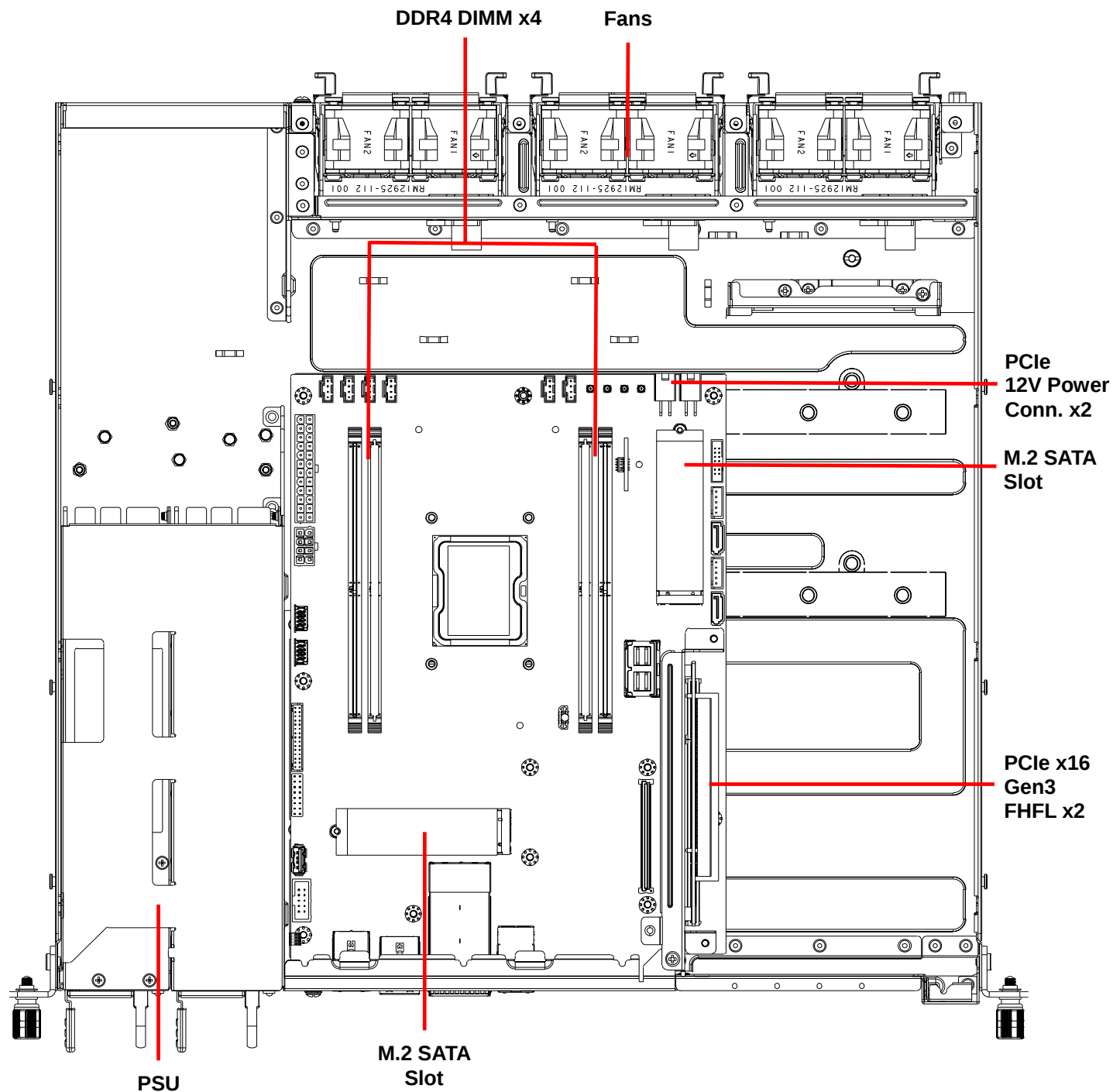


1.3.5 MECS-6110 Internal Layout



See 3.1 *Removing the Chassis Cover* on page 15 for instructions on removing the cover.

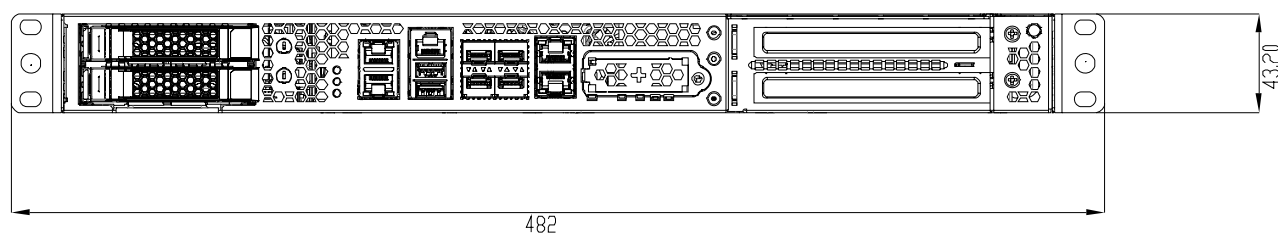
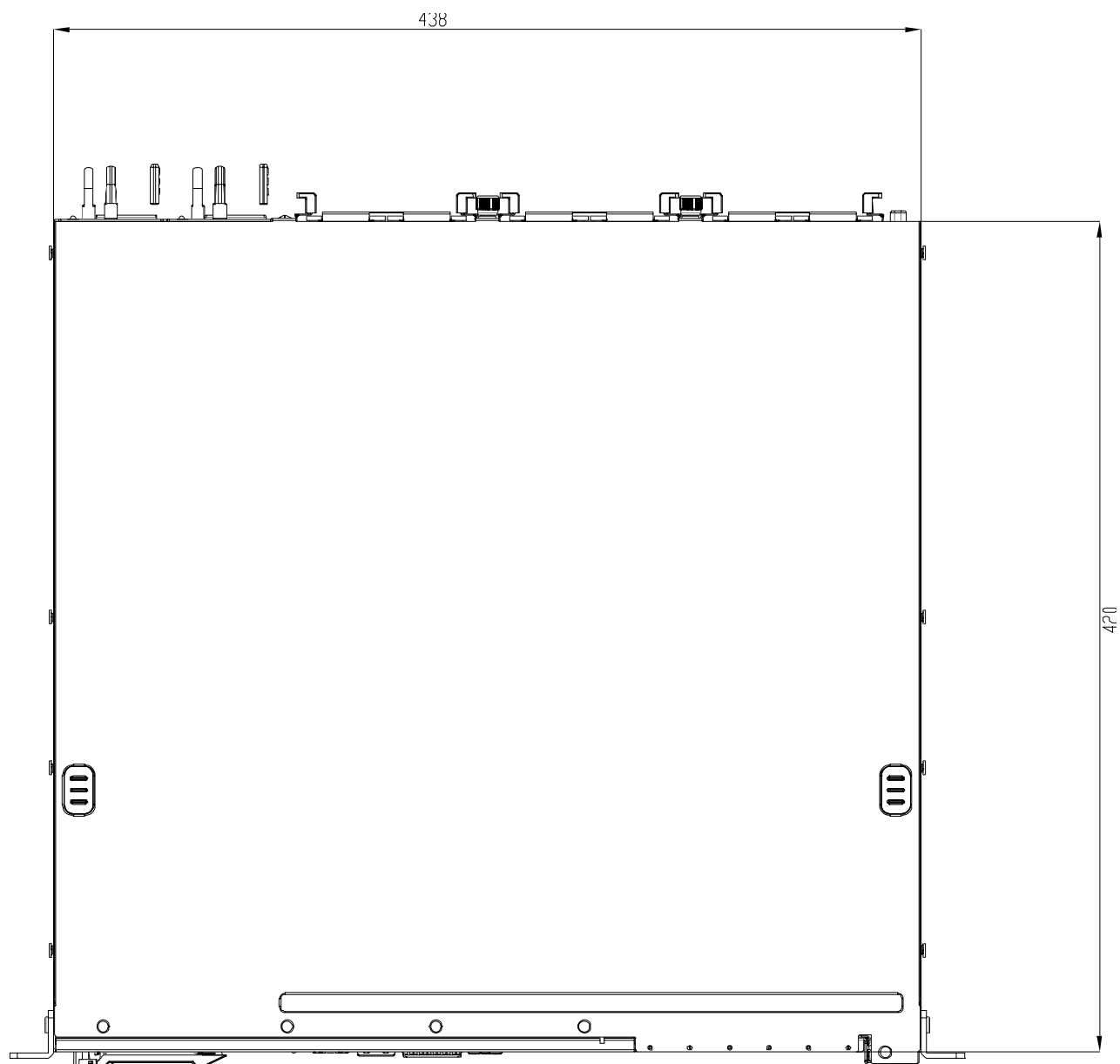
1.3.6 MECS-6111 Internal Layout



See 3.1 Removing the Chassis Cover on page 15 for instructions on removing the cover.

1.4 Mechanical Dimensions

Units: mm



2 Specifications

2.1 MECS-6110 Specifications

Main System

CPU	Intel® Xeon® D-2177NT Processor 1.90GHz (14C/28T, 105W) Intel® Xeon® D-2183IT Processor 2.20GHz (16C/32T, 100W) Intel® Xeon® D-2187NT Processor 2.00GHz (16C/32T, 110W)
Chipset	Integrated on Intel® Xeon® D SoC
Memory	4x DDR4-2666 1DPC RDIMM sockets, ECC, REG, up to 256GB
BIOS	AMI BIOS on SPI flash memory
Operating System	Microsoft Windows Server 2012/2016 CentOS Linux 7.2/7.6 SuSE Linux Enterprise Server 11/12 Note: No OS installed by default
Hardware Acceleration	100Gb/s Intel® QAT support (SKU dependent)
Trusted Platform Module	TPM1.2/2.0 module (SKU dependent)
Chassis Management	IPMI v2.0 compliant with iKVM and SOL support
Software Support	Validated with DPDK, provides a high throughput for data plane packet processing

Interfaces

Expansion (SKU dependent)	Option 1: 2x PCIe x16 Gen3 single-slot FHFL interfaces, passive cooling, up to 110W each Option 2: 1x PCIe x16 Gen3 dual-slot FHFL interface, passive cooling, up to 250W Option 3: 1x PCIe x16 Gen3 single-slot FHFL interfaces, passive cooling up to 110W +; 1x PCIe x8 Gen3 single-slot FHFL interfaces, passive cooling up to 110W +; 1x PCIe x8 Gen3 OCP NIC v2
Ethernet	2x RJ-45 100/1000BASE-T Ethernet port (front) 4x 10G SFP+ Ethernet port (front)* 2x RJ-45 1PPS/TOD port (front) *Note: SFP modules must be IEC 60825-1 certified and Class 1 laser products. For information on verified SFP modules, please contact your ADLINK representative.
Remote Console	1x RJ-45 serial port
USB	2x USB 3.0 (front) 1x USB 2.0 (internal)
Graphics	1x VGA port (rear)
LEDs	Power, Alert, Drive Activity, Health Behavior, UID
Control Buttons	Power, reset, UID (front access)
Other	1x COM (internal) 4x 1PPS MMCX input/output (internal)

Storage

Drive Bays	2x 2.5" hot-swappable SATA 6Gb/s (MECS-6110 only)
Internal	2x onboard M.2 NVME/SATA socket, 2242/2280 M Key

Mechanical & Environmental

Form Factor	1U 19" rackmount 438mm x 44mm x 420mm (WxHxD)
Fans	6 fans, adaptive speed
Power	450W/600W 1+1 redundant PSUs 100V to 240V AC @50-60Hz -36V to -72V DC
Temperature	Operating temp.: -5°C 55°C Storage temp.: -40°C to 70°C Note: Not including SATA drives and PCIe cards.
Humidity	Operating: 5% to 95%, non-condensing Storage: 5% to 95%, non-condensing
Shock	Operating: half-sine 2G, 11ms pulse, 100 pulses on each of three axes
	Non-operating: trapezoidal, 25G, 170 inches/sec delta V, three drops on each of three axes
Vibration	Non-operating: 2.2Grms, 10 minutes per axis on all three axes
Certifications	FCC, CE, CCC Class B, UL, CB and RoHS compliant Note: Certifications were passed with 450W PSU installed.
MTBF	1043140 hours @ 25°C

3 Getting Started

3.1 Removing the Chassis Cover

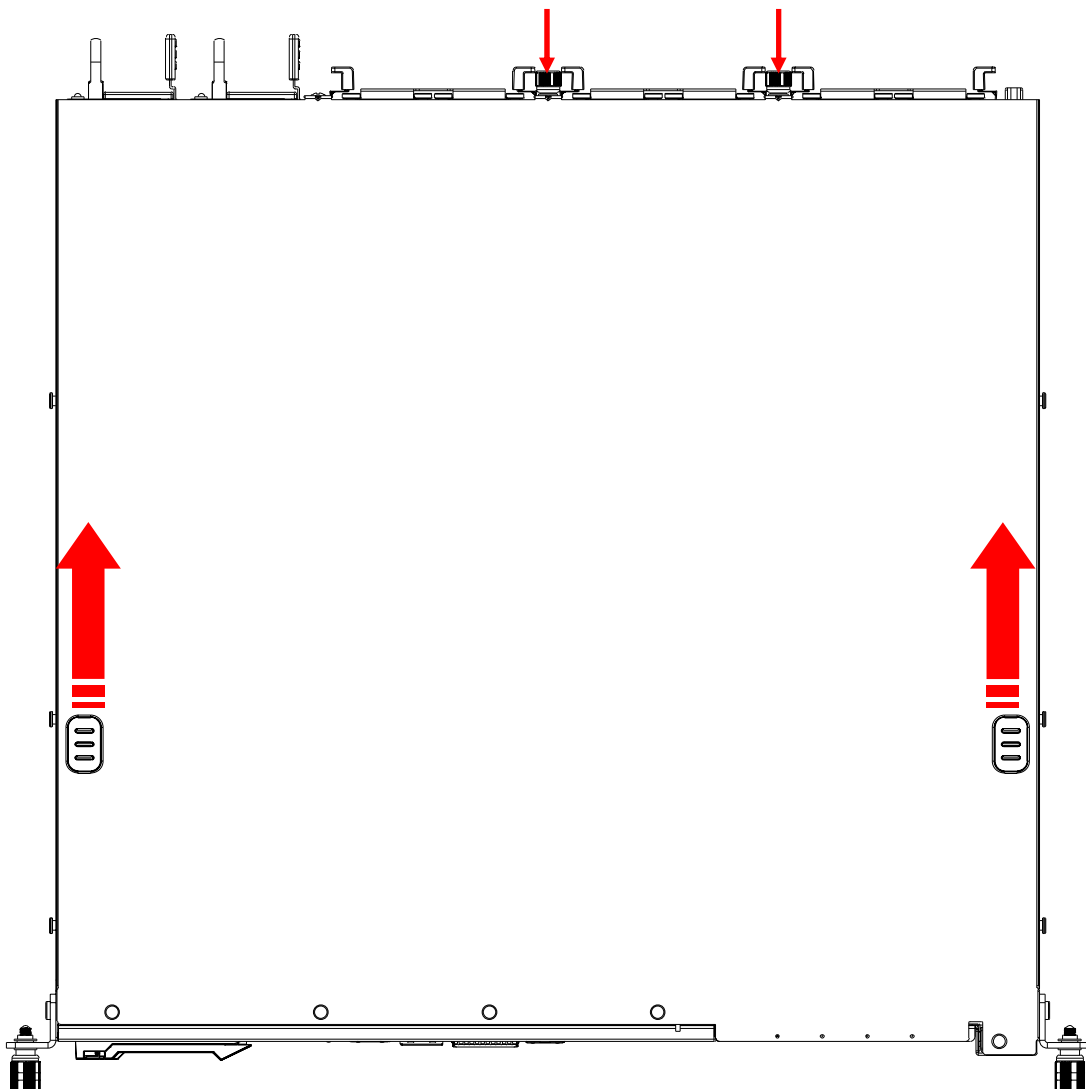
Follow the instructions below to remove the chassis top cover.



All installation procedures are restricted to skilled personnel.

Toutes les procédures d'installation sont réservées au personnel qualifié.

1. Loosen the two captive screws at the rear of the cover (arrows).



2. Press down on the two depressions with your thumbs and slide the cover towards the rear of the chassis and remove the cover.

To reinstall the cover, slide it towards the front of the chassis, then tighten the screws loosened in Step 1.

3.2 Installing Memory Modules

There are no limitations on installing memory modules in this device. Each slot can accept a memory module up to 64GB.



All installation procedures are restricted to skilled personnel.

Toutes les procédures d'installation sont réservées au personnel qualifié.

3.3 PCIe Card Installation

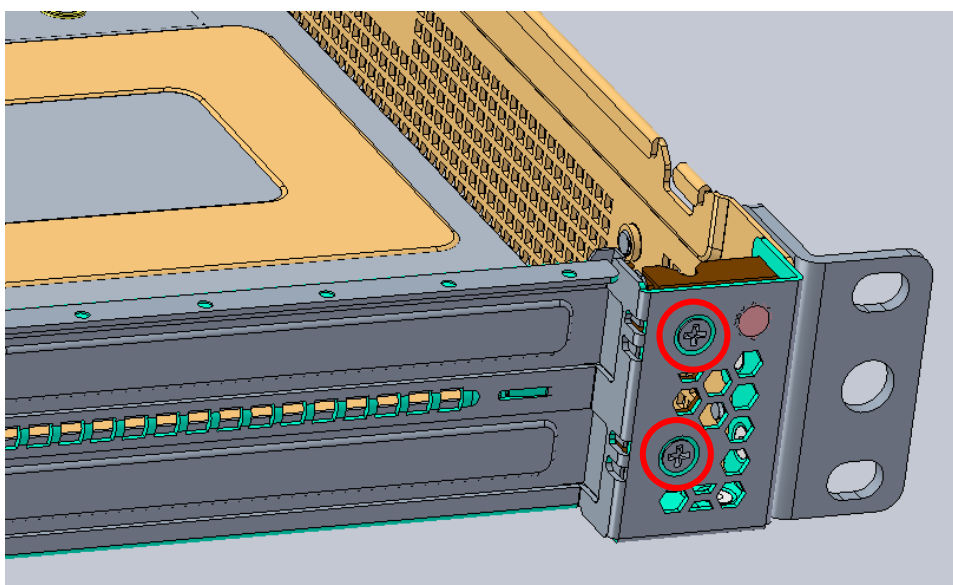
Sample installation instructions for FHFL PCIe expansion cards are described below. For detailed information on the specific installation procedures for your cards, please contact your ADLINK representative.



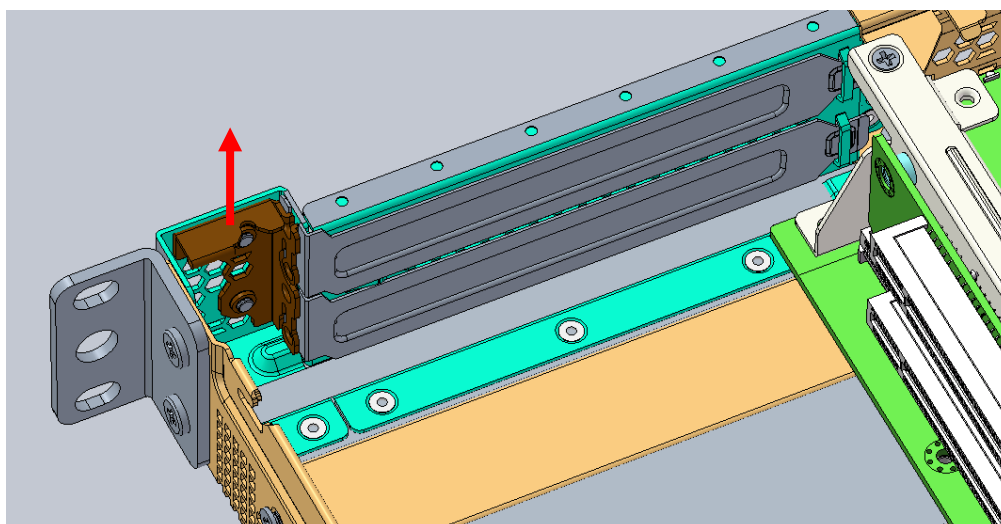
All installation procedures are restricted to skilled personnel.

Toutes les procédures d'installation sont réservées au personnel qualifié.

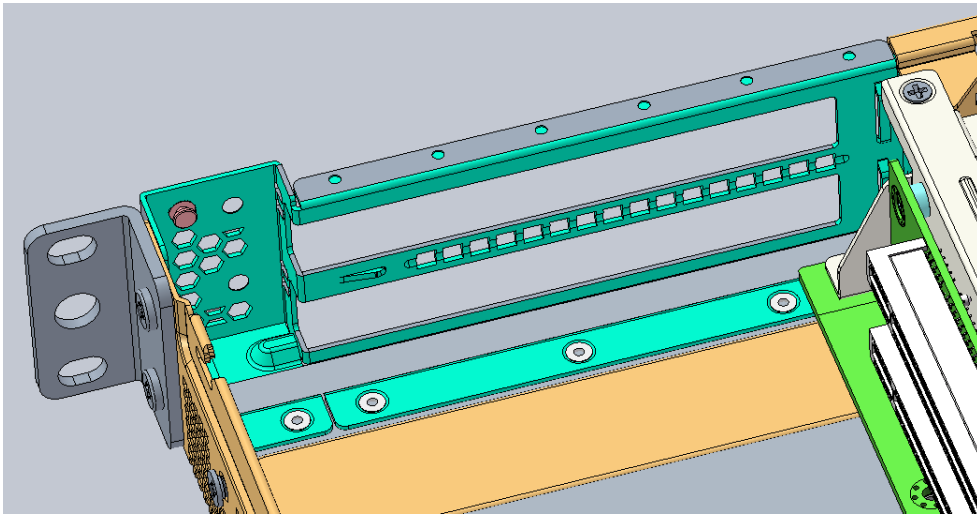
1. Remove the two screws from the front panel as shown.



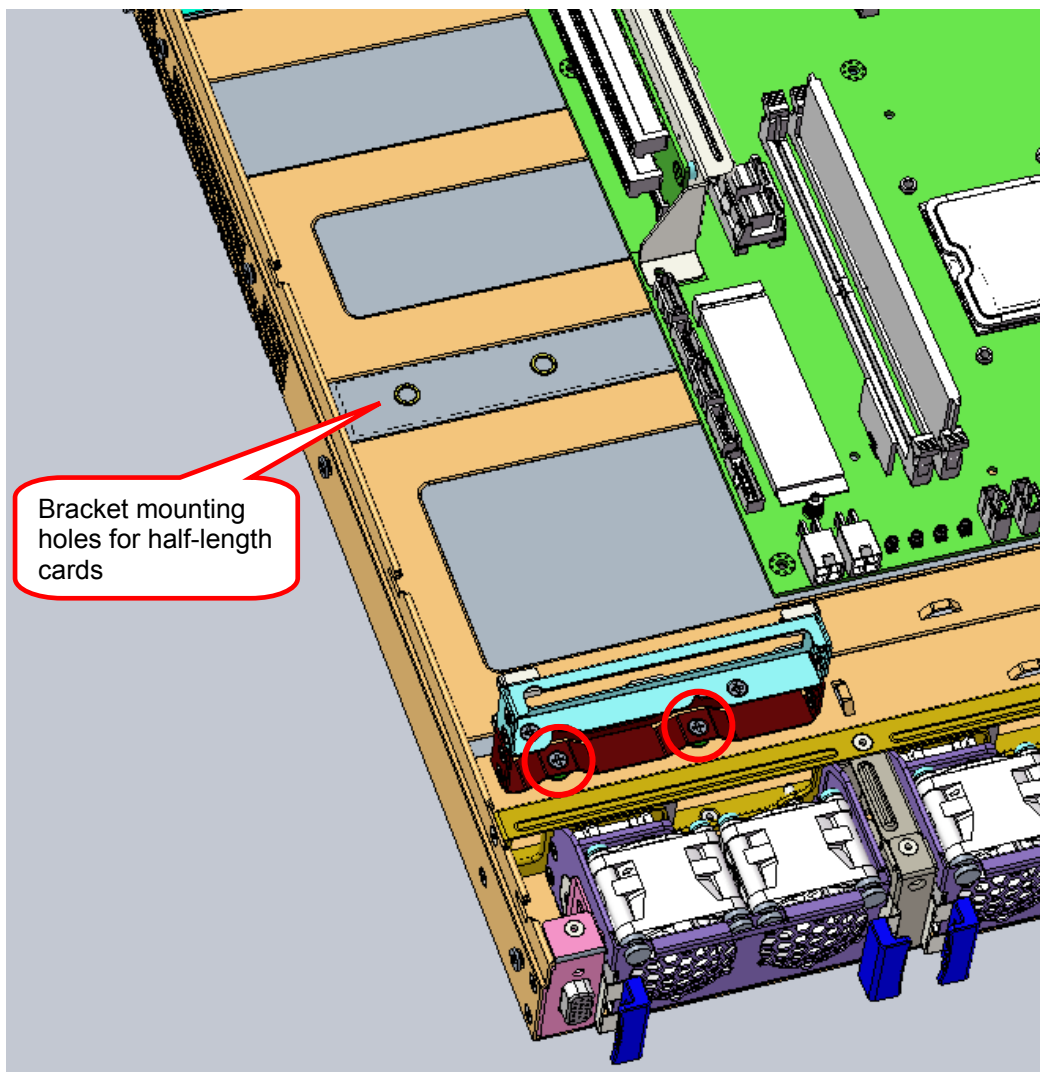
2. Remove the bracket securing the PCIe bracket blanking plates.



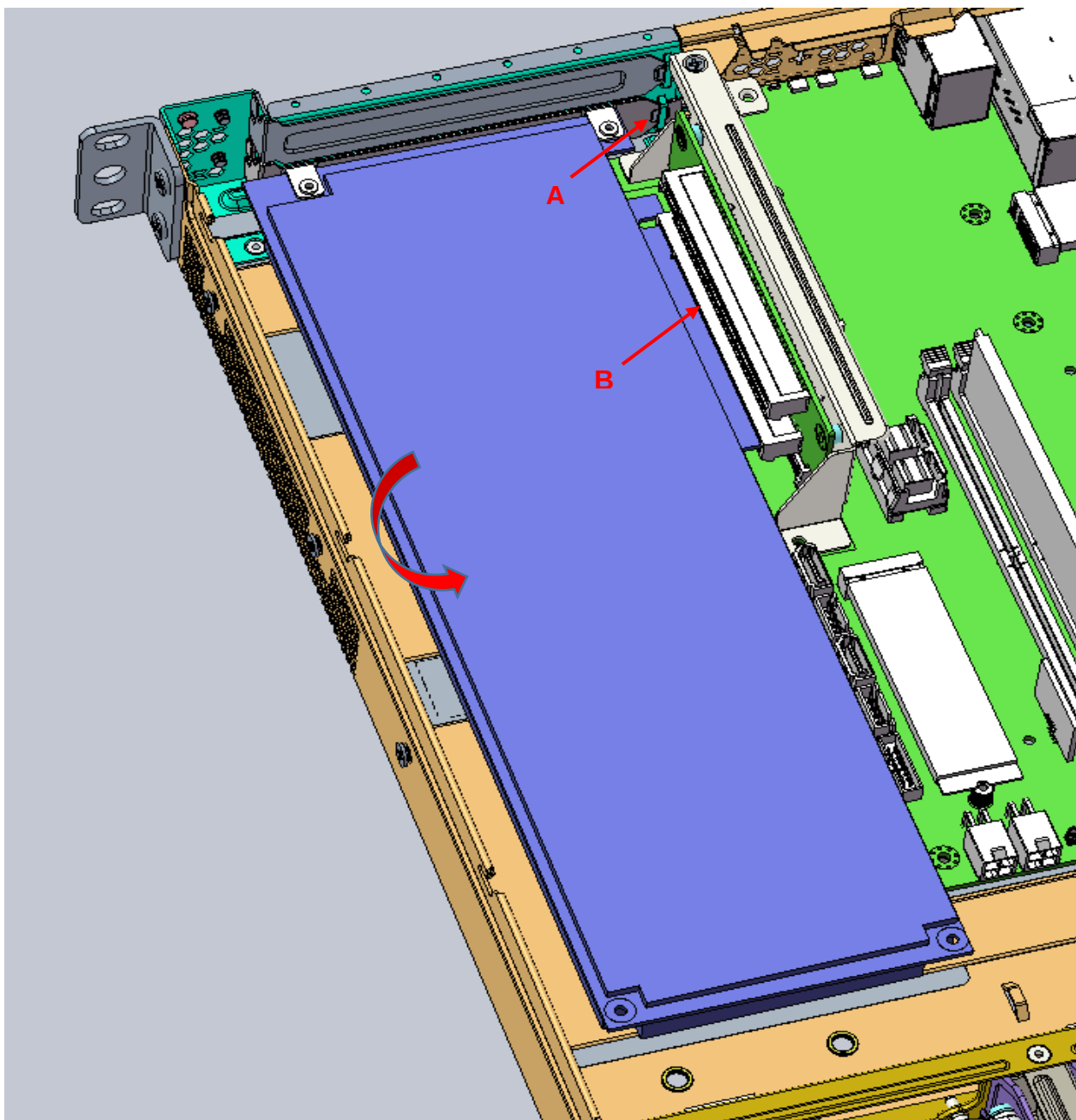
3. Remove the PCIe bracket blanking plates.



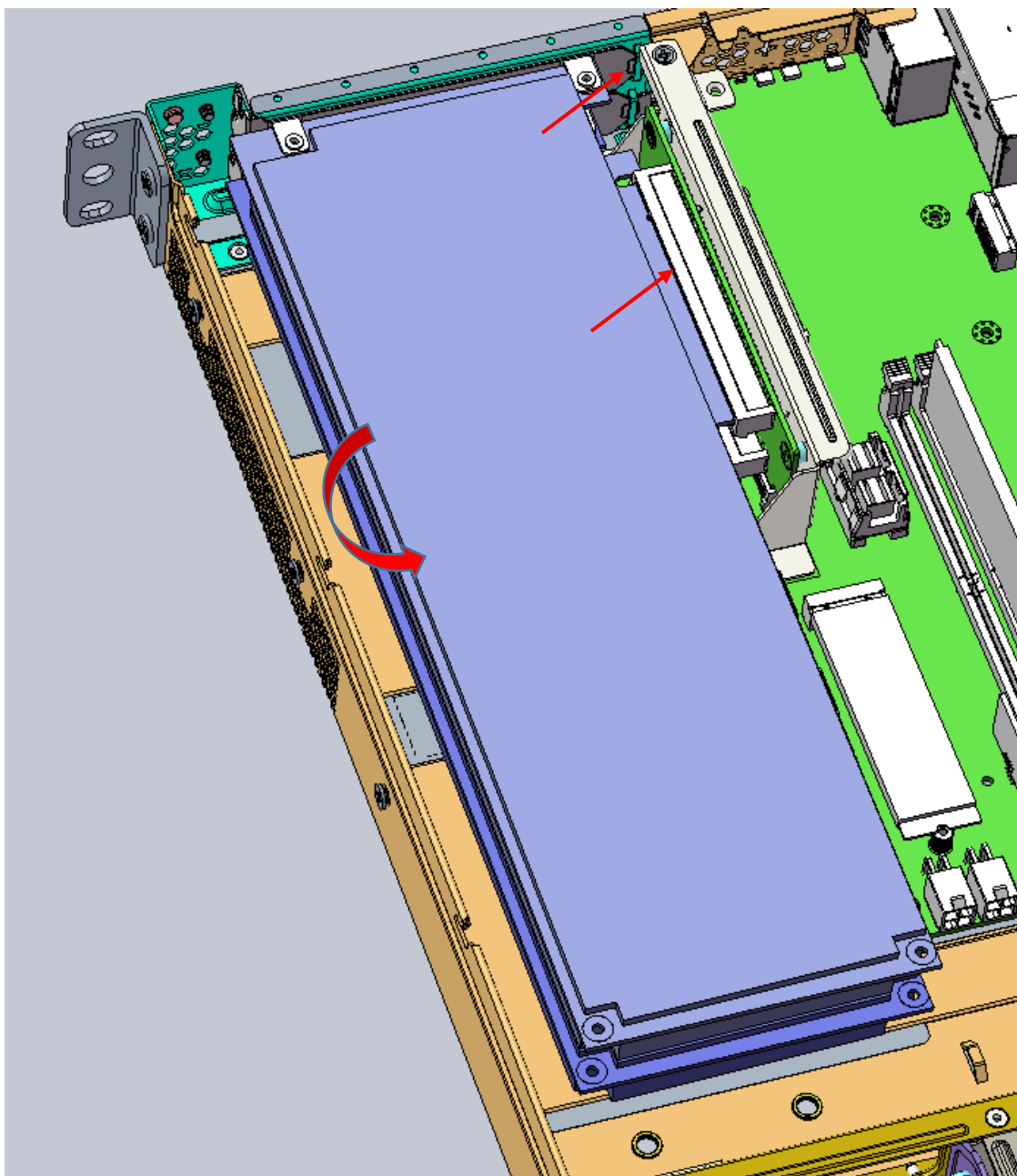
4. Loosen the two screws to remove the internal PCIe bracket used to secure the PCIe cards inside the chassis. The diagram shows the position of the bracket for full-length cards.



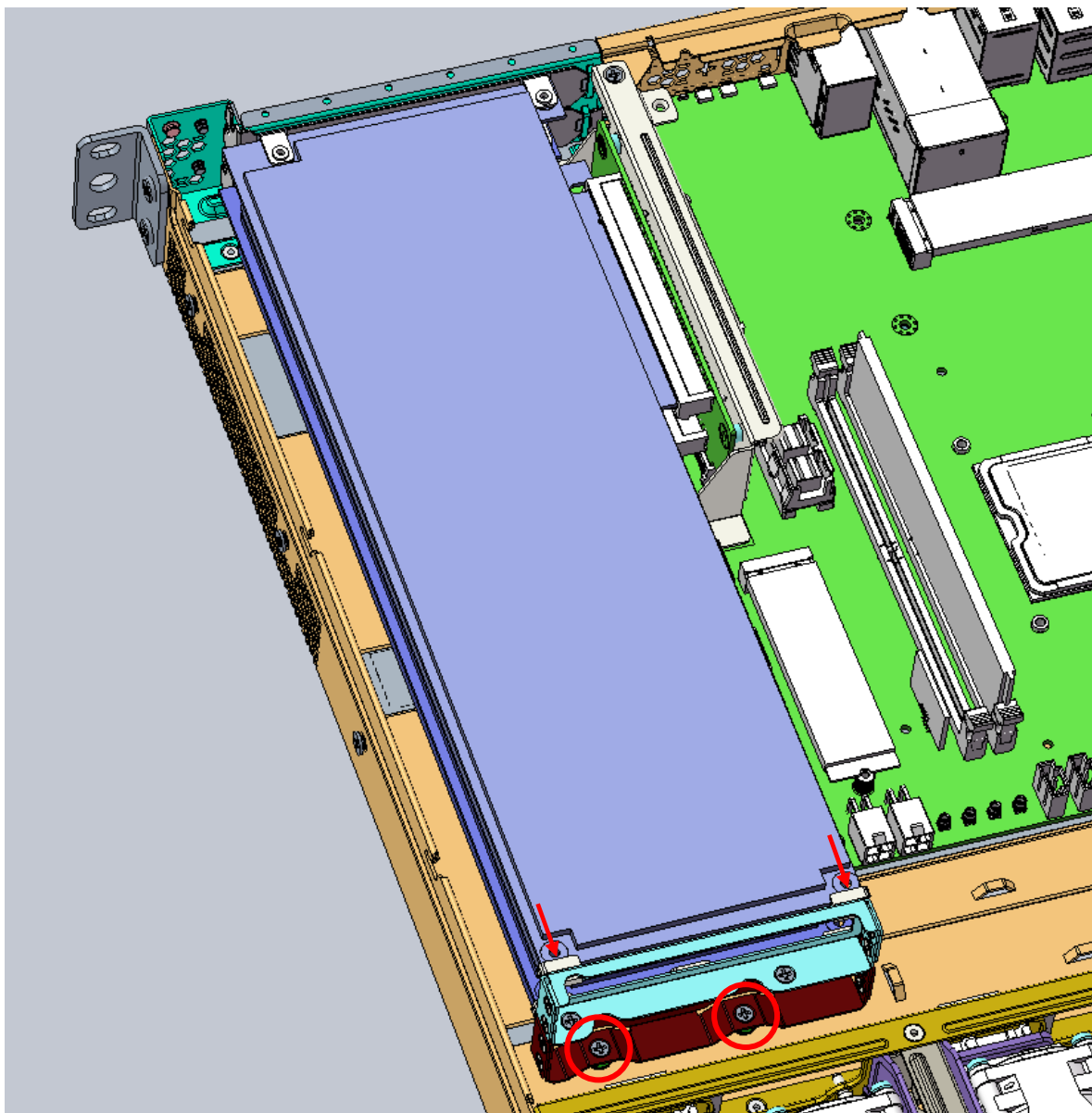
5. First install the lower PCIe expansion card. Align the tab on the bracket with the opening on the rear I/O panel (A), and insert the PCIe connector into the slot on the riser card (B). Make sure the connector is fully inserted into the PCIe slot.



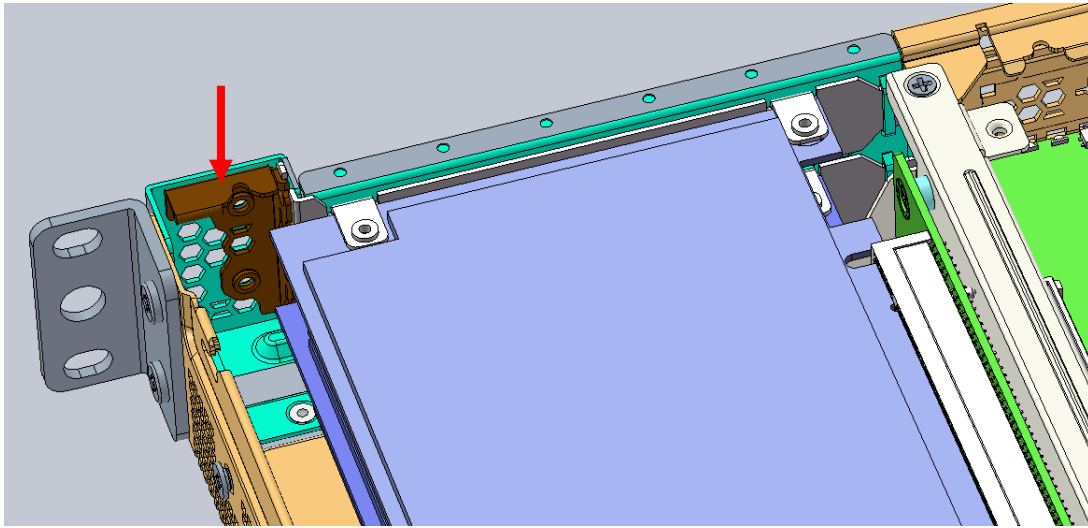
6. Then install the upper PCIe expansion card, if required



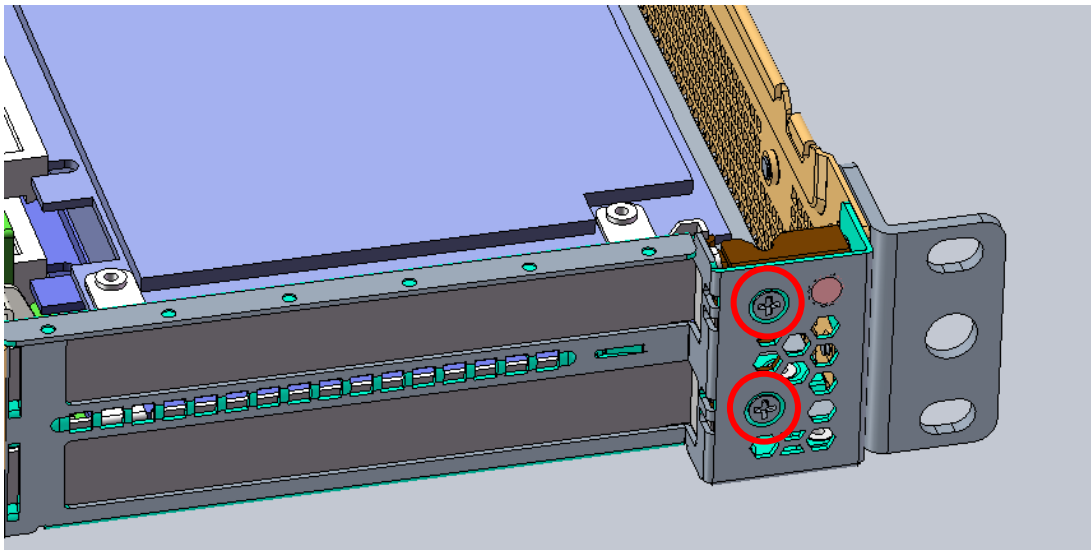
7. Replace the internal PCIe bracket, insert the PCIe cards into the slots (arrows), and tighten the two screws (circles) to secure the cards inside the chassis.



8. Replace the bracket to secure the PCIe I/O brackets to the chassis.



9. Secure the bracket with two screws as shown.



3.4 PCIe Slot Secondary Power Supply

The MECS-6110 is equipped with two 4-pin ATX-type 12V power connectors on the mainboard (see 1.3.5 MECS-6110 Internal Layout on page 10) to provide secondary power for PCIe expansion cards if required. Two adapter cables are included. The pin definitions of the connectors and cables are described below.

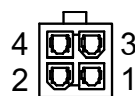


All installation procedures are restricted to skilled personnel.

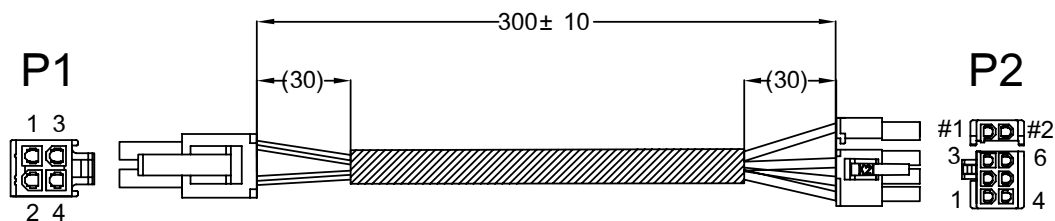
Toutes les procédures d'installation sont réservées au personnel qualifié.

4-pin ATX-type 12V Power Connector Pinout

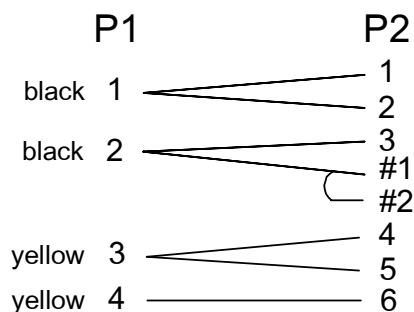
Pin #	Signal	Color
1	GND	black
2	GND	black
3	P12V	yellow
4	P12V	yellow



Adapter Cable Connector Pinout



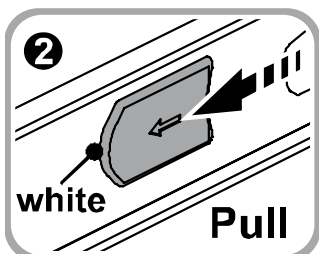
Pinout



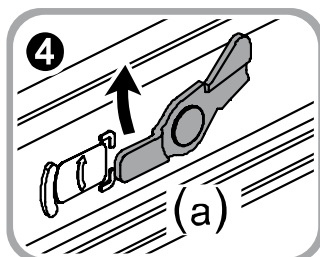
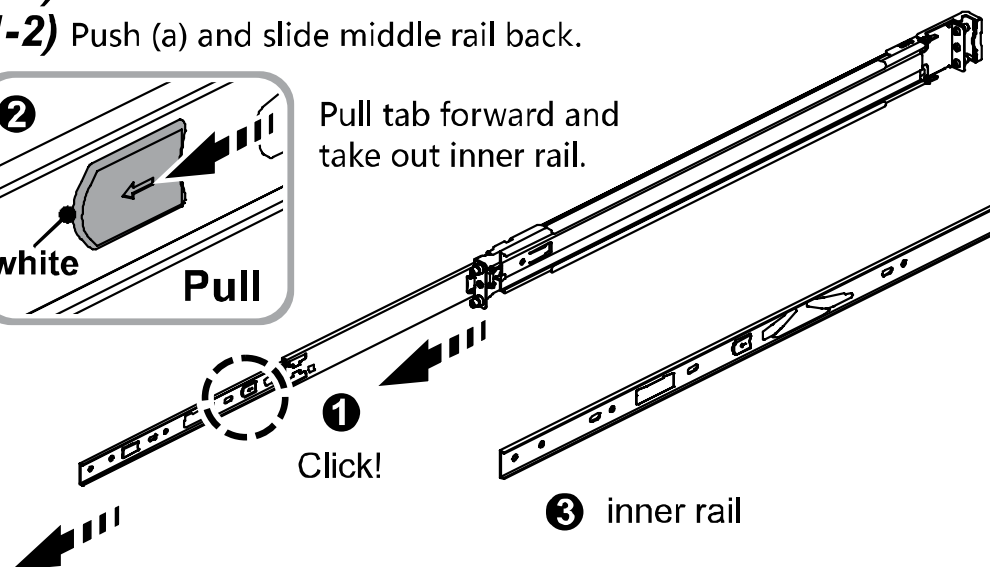
3.5 Rails Assembly and Rack Installation

1-1) Remove the inner rail.

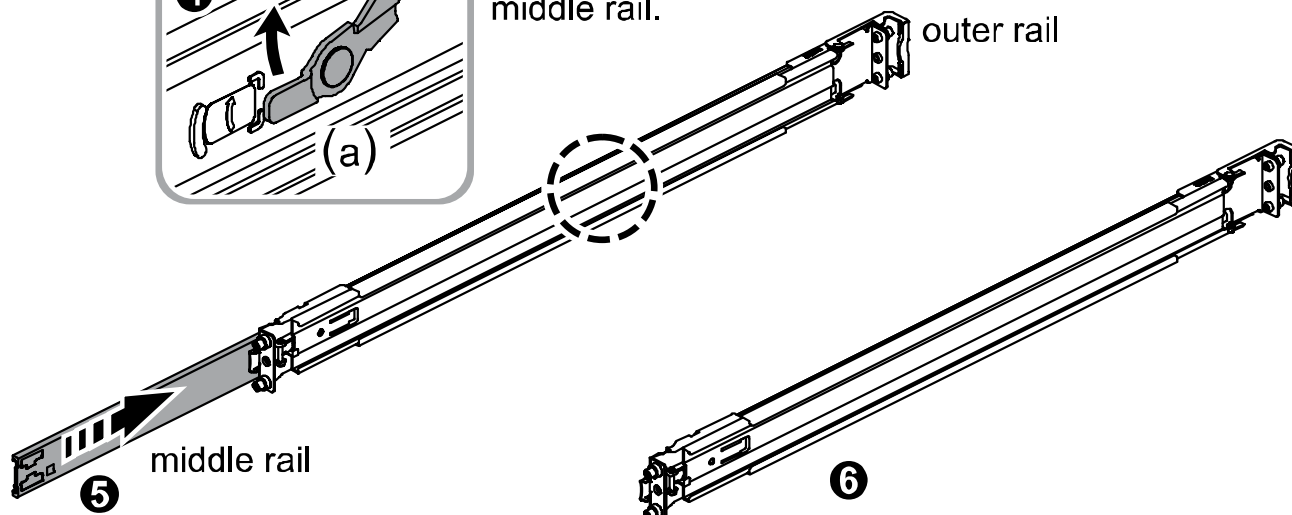
1-2) Push (a) and slide middle rail back.



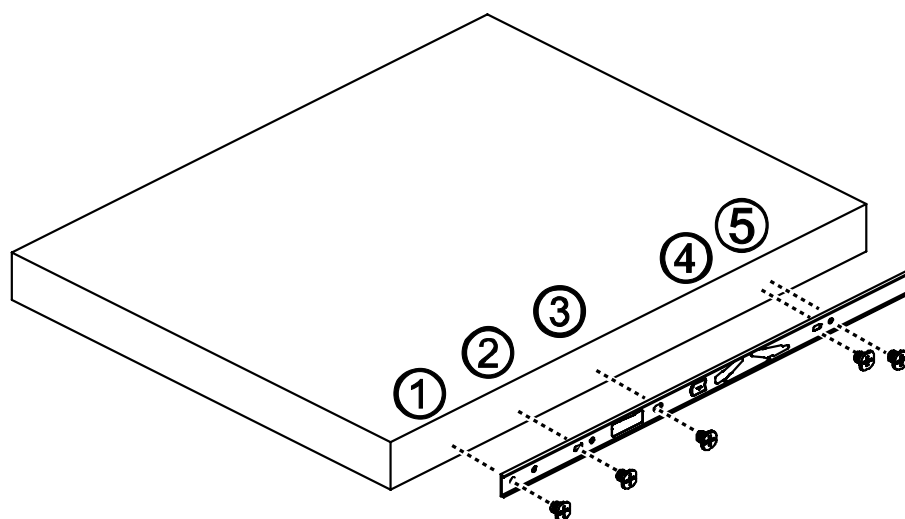
Pull tab forward and
take out inner rail.



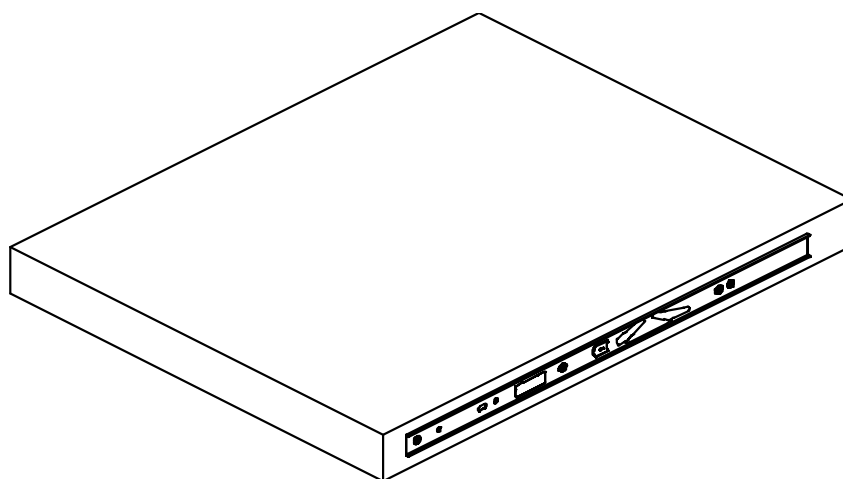
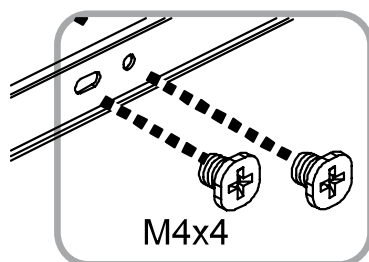
Push tab to slide the
middle rail.



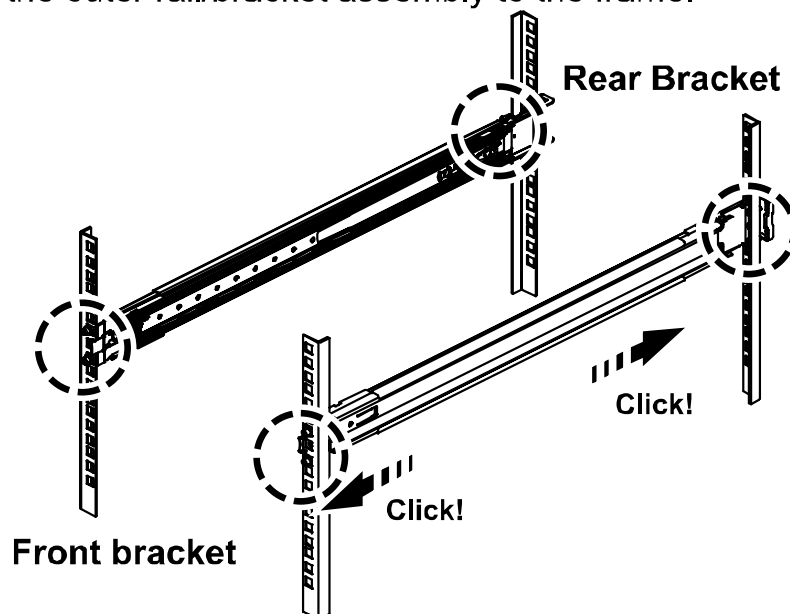
2) Install the inner rail onto the chassis.



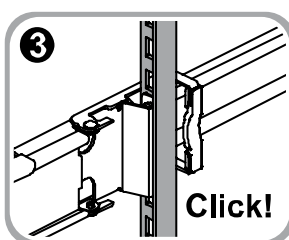
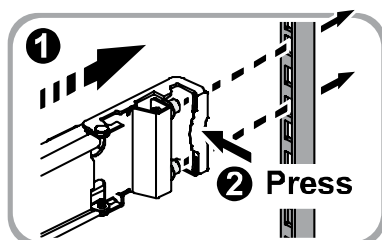
① Screw Hole ①-⑤



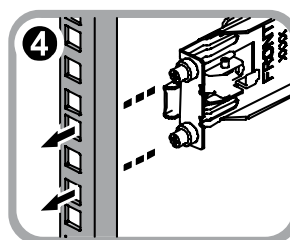
4) Fix the outer rail/bracket assembly to the frame.



Rear Bracket

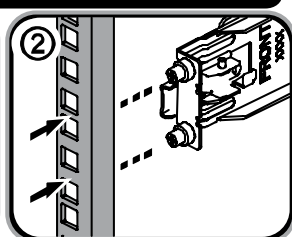
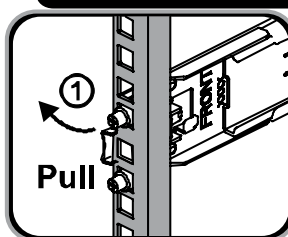


Front bracket

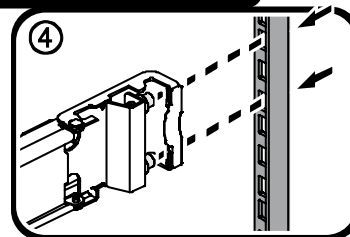
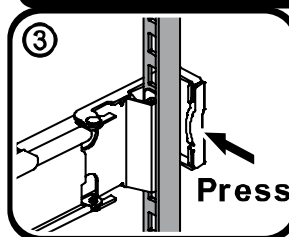


① Pull the rear bracket the fully extender position.

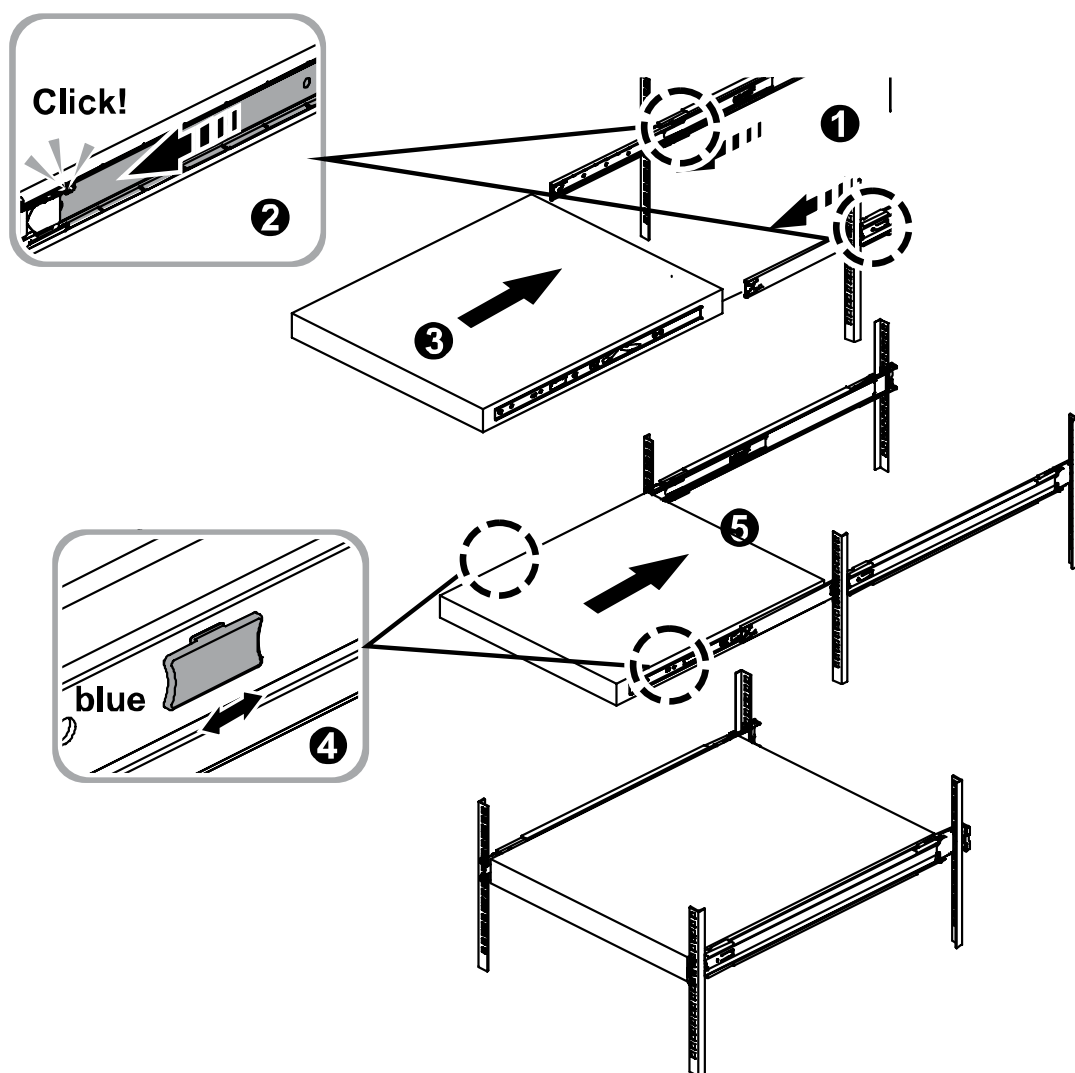
Detach Front Bracket from Rack Post



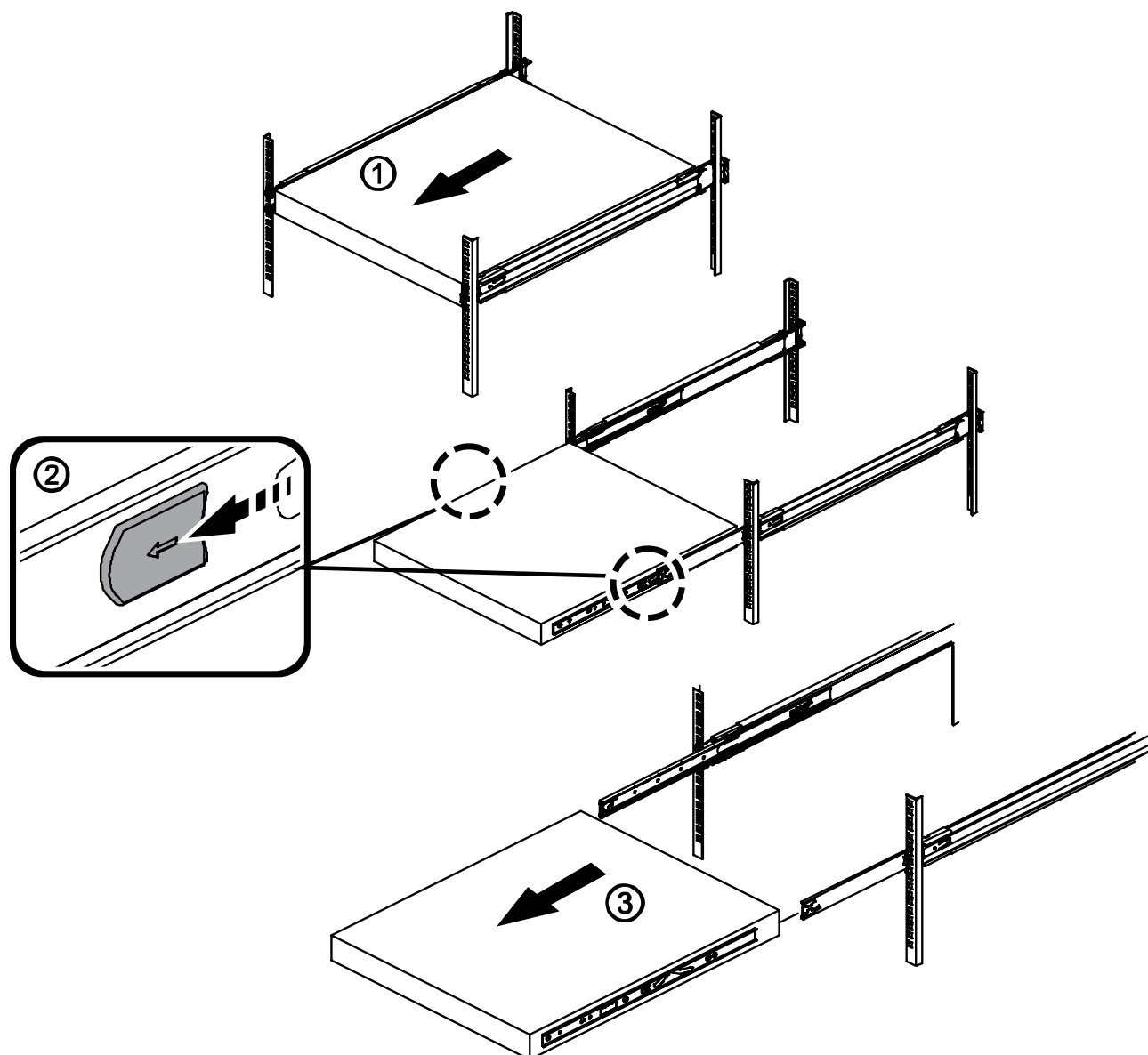
Detach Rear Bracket from Rack Post



- 5) Insert the chassis to complete the installation.
- ①② Pull the middle rail fully extended in lock position, ensure ball bearing retainer is located at the front of the middle rail.
 - ③ Insert the chassis into middle-outer rails.
 - ④ ⑤ When hit a stop, please pull/push the blue release tab on the inner rails.



3.6 Remove the Chassis from the Rack

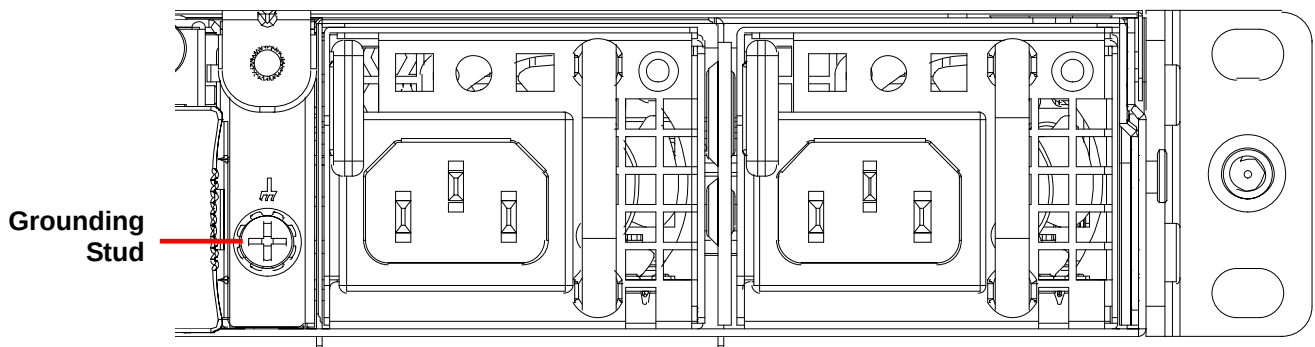


3.7 Connecting the System to Ground

AC Version

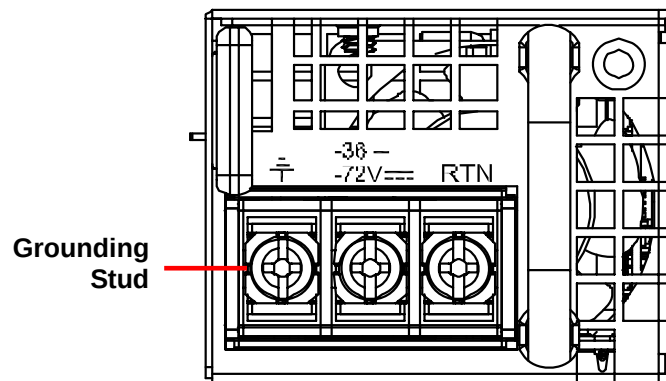
The MECS-6110 is connected to ground by the ground pin of the 3-prong IEC power cord. Please use the power cord provided with the system for your region.

A grounding stud (M4 size) is provided on the rear of the chassis for additional connection to ground.



DC Version

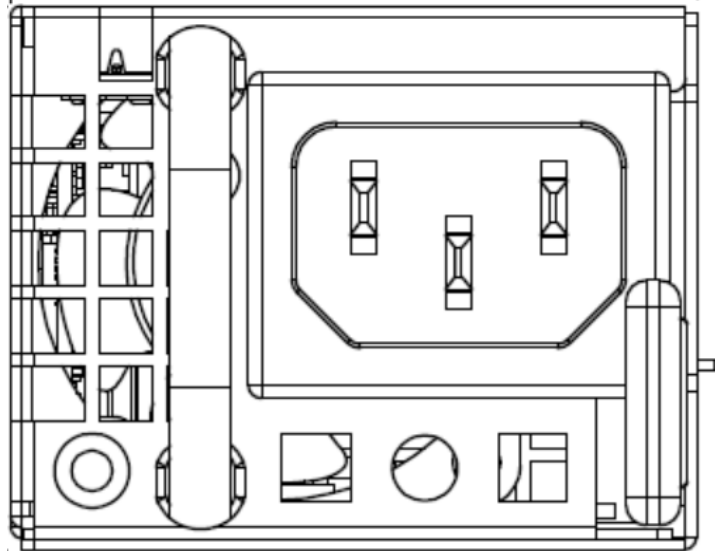
A grounding stud (M3.5, steel zinc plated) is provided on the rear of the chassis for connection to ground.



3.8 System Power Cable Installation

AC PSU Input

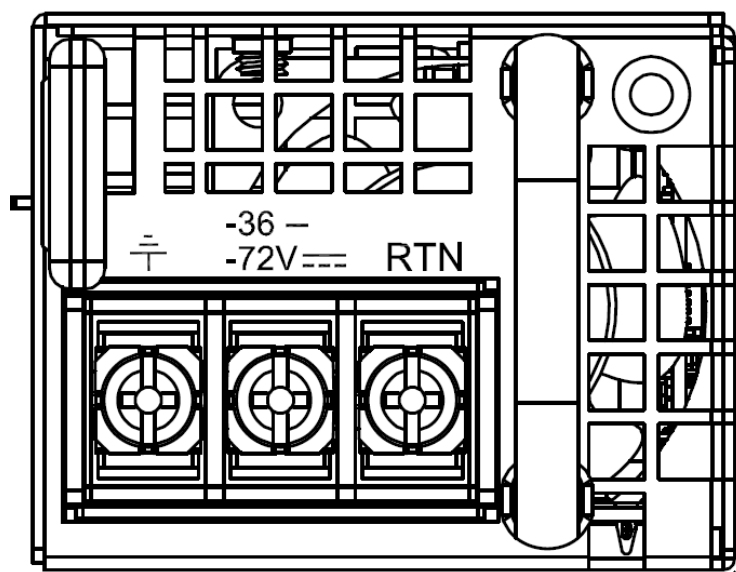
3-prong IEC power cord



DC PSU Input

DC Negative: connect to -36V to -72V

DC Positive: connect to RTN



3.9 Login to the BMC via Console Port

Step 1

Set the Console Port to BMC mode using CN15/16 on the mother board inside the chassis (see 4.9 *Board Layout* on page 50).

Console Port Mode	CN15	CN16
default	1-2	1-2
BMC	2-3	2-3

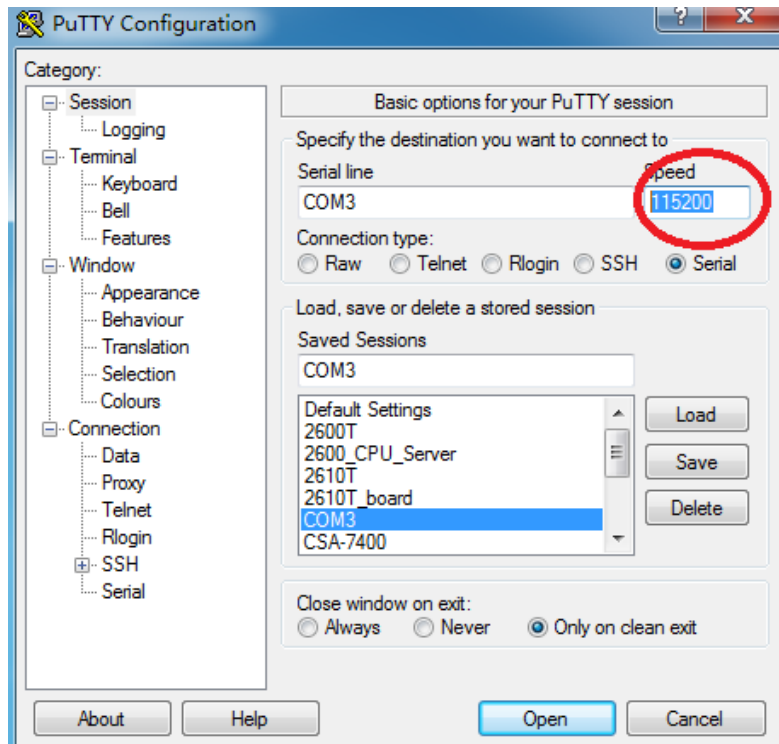
Step 2

Use the included RJ-45 to DB-9 console port adapter cable to connect the PC to the RJ-45 console port of the MECS-6110 (see 1.3.1 *MECS-6110 Front Panel* on page 8). See 4.5 *Dual USB 3.0 and RJ-45 Console Port* on page 46 for the adapter cable pin definition.



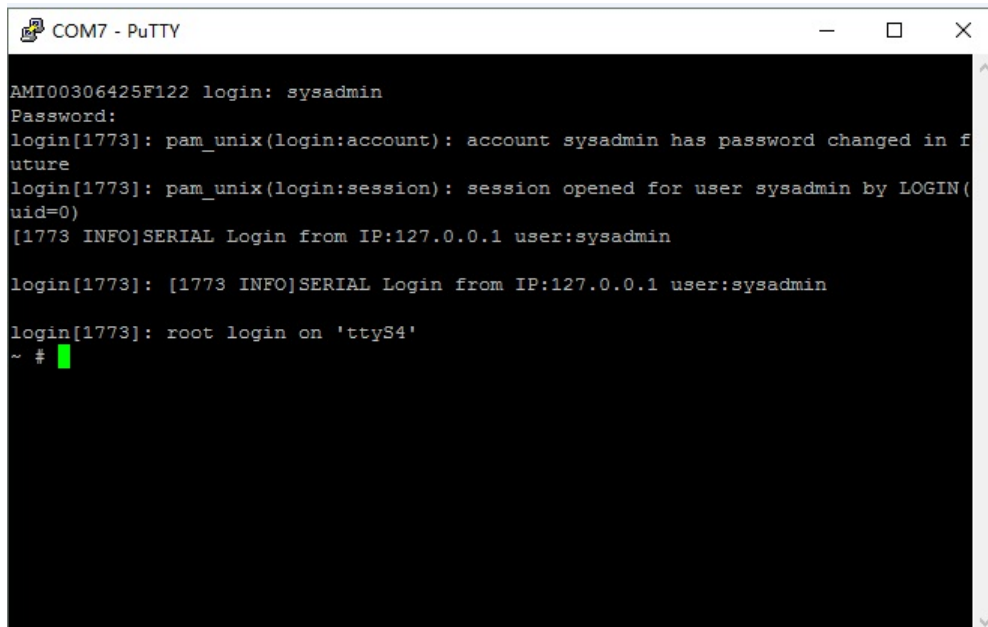
Step 3

Open a serial port console tool (such as PuTTY), choose the higher COM port (it may be different depending on the computer), then set the baud rate to 115200.



Step 3

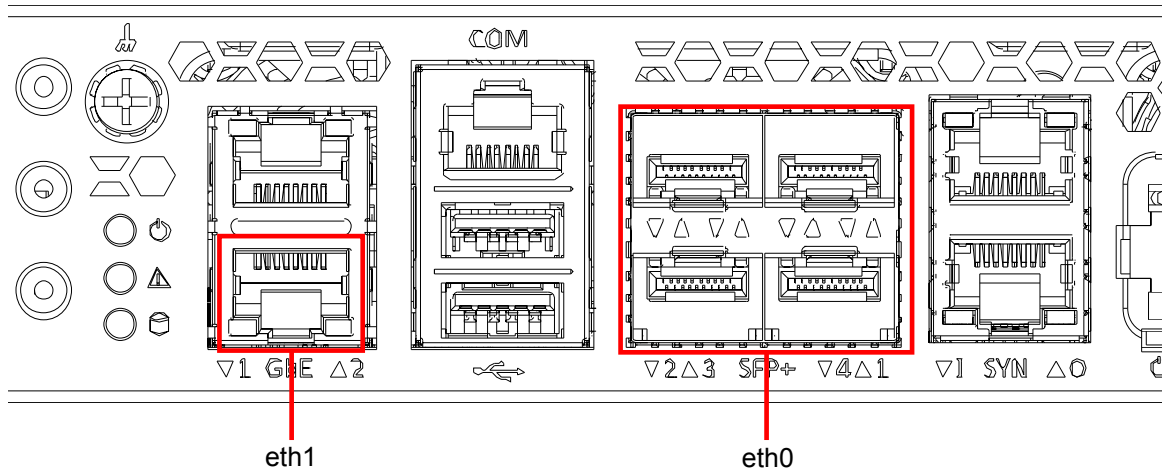
Input the user name “sysadmin” and password “superuser” to login to the system.



3.10 Login to the BMC via Network

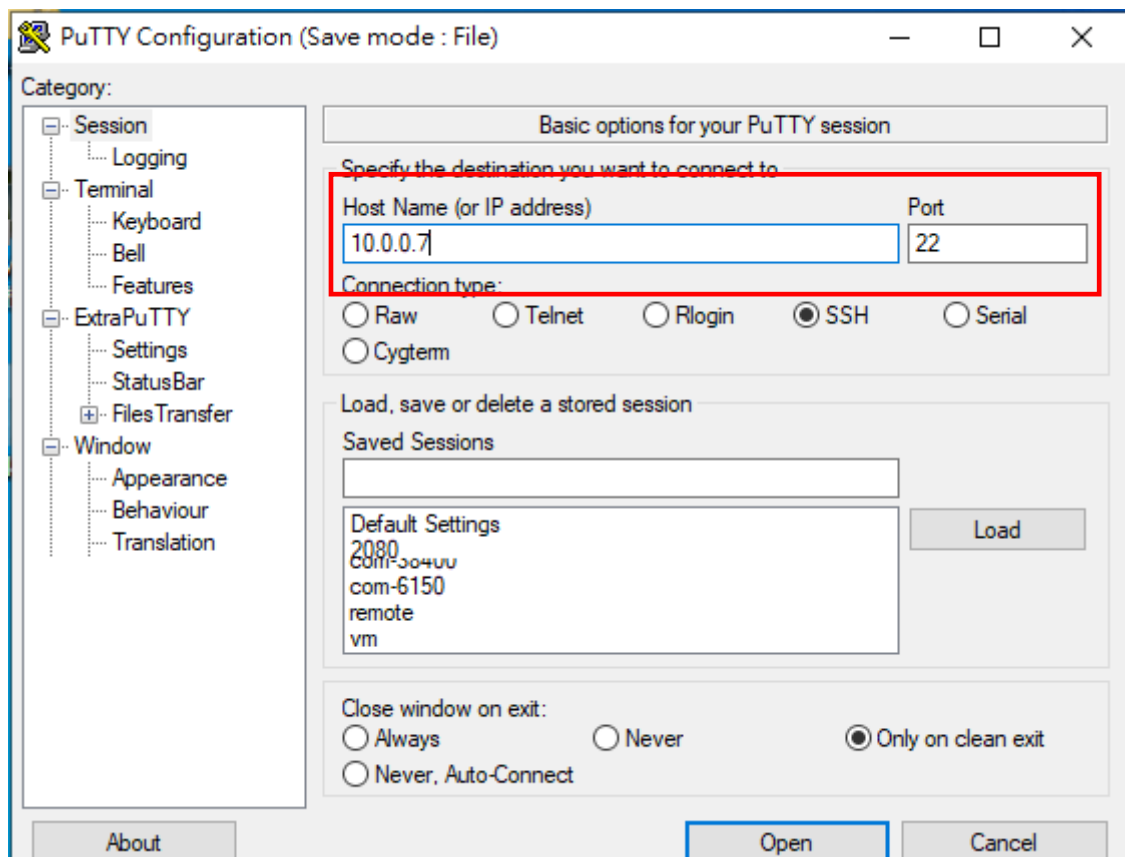
Step 1

Use a LAN cable to connect either eth0 or eth1 of the MECS-6110 to the PC;



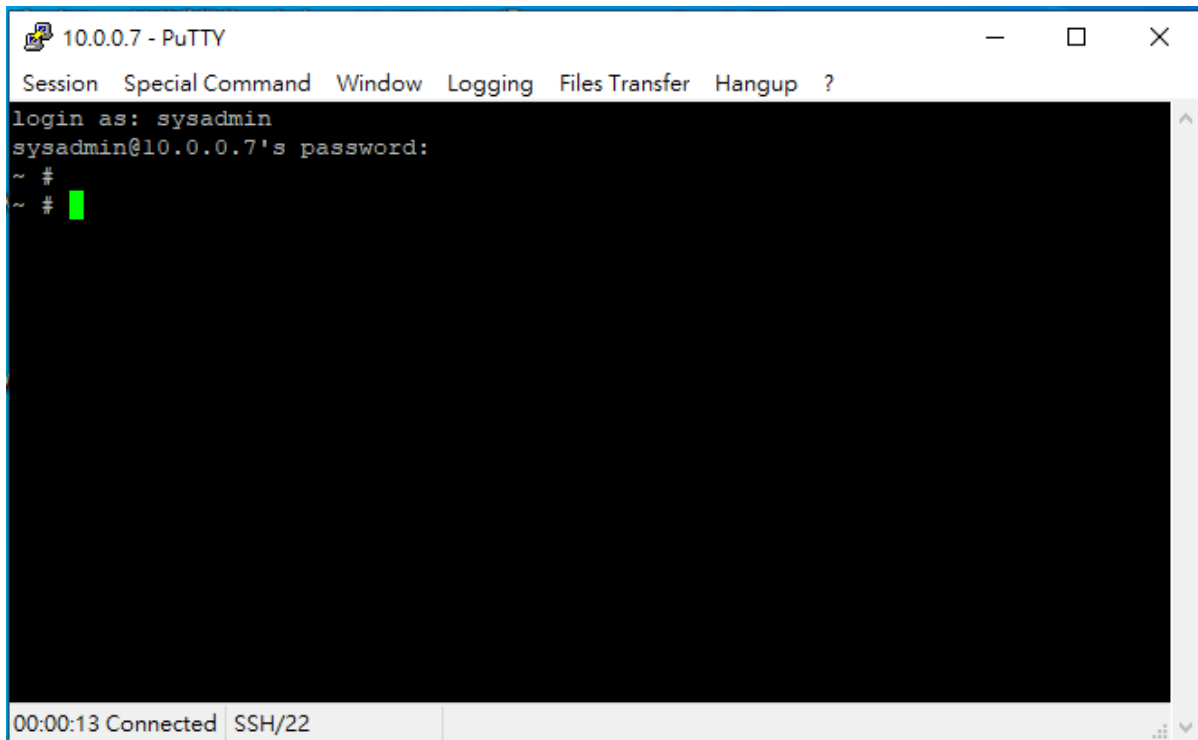
Step 2

Open a serial port console tool (such as PuTTY) enter the IP address, and open a connection to the BMC (login using serial console first to check the IP address).



Step 3

Input the user name “sysadmin” and password “superuser” to login to the system.



The screenshot shows a PuTTY terminal window titled "10.0.0.7 - PuTTY". The menu bar includes "Session", "Special Command", "Window", "Logging", "Files Transfer", "Hangup", and "?". The terminal output shows the login process: "login as: sysadmin", "sysadmin@10.0.0.7's password:", and two lines of "~ #". A green cursor is visible on the second line. The status bar at the bottom indicates "00:00:13 Connected" and "SSH/22".

```
10.0.0.7 - PuTTY
Session Special Command Window Logging Files Transfer Hangup ?
login as: sysadmin
sysadmin@10.0.0.7's password:
~ #
~ #
```

00:00:13 Connected SSH/22

3.11 BMC eth0 Default and Static IP Settings

The default IP setting is DHCP. Users can login to the BMC to modify the IP.

Static IP Settings:

Show the current LAN setting

- `ipmitool lan print 1`

Set the IP source to static

- `ipmitool lan set 1 ipsrc static`

Set the IP address

- `ipmitool lan set 1 ipaddr xxx.xxx.xxx.xxx`

Set the netmask address

- `ipmitool lan set 1 netmask xxx.xxx.xxx.xxx`

Set the gateway address

- `ipmitool lan set 1 defgw ipaddr xxx.xxx.xxx.xxx`

Restore Default:

Set IP source to DHCP

- `ipmitool lan set 1 ipsrc dhcp`

Note: BMC IP can be set in the BIOS. Refer to “5.8.3 Sub-Menu: BMC Network Configuration”.

3.12 BMC eth1 Default and Static IP Settings

The default IP setting is DHCP. Users can login to the BMC to modify the IP.

Static IP Settings:

Show the current LAN setting

- `ipmitool lan print 8`

Set the IP source to static

- `ipmitool lan set 8 ipsrc static`

Set the IP address

- `ipmitool lan set 8 ipaddr xxx.xxx.xxx.xxx`

Set the netmask address

- `ipmitool lan set 8 netmask xxx.xxx.xxx.xxx`

Set the gateway address

- `ipmitool lan set 8 defgw ipaddr xxx.xxx.xxx.xxx`

Show the lan after setting

- `ipmitool lan print 8`

Restore Default:

Set IP source to DHCP

- `ipmitool lan set 8 ipsrc dhcp`

Note: BMC IP can be set in the BIOS. Refer to “5.8.3 Sub-Menu: BMC Network Configuration”.

3.13 BIOS Update

Users can update the MECS-6110 system BIOS over various interfaces (Gigabit LAN, KCS, console port).

3.13.1 Updating the BIOS via Network with BMC Tool

1. Install a Linux distribution, such as Ubuntu 14, to the debug PC.
2. Install “expect” to your debug PC (ex: sudo apt-get install expect).
3. Copy the BMC FW package “BMC_MECS-6110_Release_Vx.xx” to the debug PC;

Upgrade Procedure:

1. Check the IP of the BMC of MECS-6110. Power on the MECS-6110, boot the BMC to Linux (username: sysadmin; Passwd: superuser), and type “ifconfig” check its IP address.

```

~ # ifconfig
eth0      Link encap:Ethernet  HWaddr 00:30:64:DD:AA:AC
          inet addr:11.0.0.11  Bcast:11.255.255.255  Mask:255.0.0.0
          inet6 addr: fe80::230:64ff:fedd:aaac/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:232 errors:0 dropped:0 overruns:0 frame:0
          TX packets:323 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:17190 (16.7 KiB)  TX bytes:18475 (18.0 KiB)
          Interrupt:2

eth1      Link encap:Ethernet  HWaddr 00:30:64:DD:AA:AB
          inet6 addr: fe80::230:64ff:fedd:aaab/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:114 errors:0 dropped:0 overruns:0 frame:0
          TX packets:223 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:7079 (6.9 KiB)  TX bytes:18726 (18.2 KiB)
          Interrupt:3

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:328 errors:0 dropped:0 overruns:0 frame:0
          TX packets:328 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:30462 (29.7 KiB)  TX bytes:30462 (29.7 KiB)

```

2. On the debug PC, execute the following commands to perform the upgrade.

```

cd BMC_MECS-6110_Release_Vx.xx
cd BIOS
./adlinktool.sh upgradebios1 BIOS_xxxx.bin 11.0.0.11

```

Note: Only “bin” files are supported when updating the BIOS via Network.

3.13.2 Updating BIOS via Host with BIOS Tool

1. Boot/Login to Shell
2. Update the BIOS over host with the following commands.

Example:

AfuEfix64 BIOS.ROM /p /b /n /x (to update BIOS without ME)
AfuExfi64 BIOS.BIN /p /b /n /x /me (to update the entire BIOS)

```
fs1:\AFU_EFI> cd ..

fs1:\> cd MECS-6110_10210_FullImage

fs1:\MECS-6110_10210_FullImage> dir
Directory of: fs1:\MECS-6110_10210_FullImage

11/13/20  04:38p <DIR>          16,384  .
11/13/20  04:38p <DIR>           0      ..
07/08/19  11:25a             513,648  AfuEfix64.efi
10/14/20  02:24p              5,837  HISTORY.txt
10/14/20  01:42p          33,554,432  MECS-6110_10210.BIN
10/14/20  01:41p          16,777,216  MECS-6110_10210.ROM
10/14/20  02:24p              402  pBIOS.nsh
10/15/20  01:23p              397  pSpi.nsh
        6 File(s)  50,851,932 bytes
        2 Dir(s)

fs1:\MECS-6110_10210_FullImage> _
```

3.14 BMC Firmware Update via Network

The MECS-6110 supports a BMC Chassis Management firmware, IPMI v2.0 compliant. To update the BMC firmware via network, perform the following steps.

1. Install a Linux distribution, such as Ubuntu 14, to the debug PC.
2. Install “expect” to your debug PC (ex: sudo apt-get install expect).
3. Copy the BMC FW package “BMC_MECS-6110_Release_Vx.xx” to the debug PC;

Upgrade Procedure:

1. Check the IP of the BMC of MECS-6110. Power on the MECS-6110, boot the BMC to Linux (username: sysadmin; Passwd: superuser), and type “ifconfig” check its IP address.

```

~ # ifconfig
eth0      Link encap:Ethernet  HWaddr 00:30:64:DD:AA:AC
          inet addr:11.0.0.11  Bcast:11.255.255.255  Mask:255.0.0.0
          inet6 addr: fe80::230:64ff:fedd:aaac/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:232 errors:0 dropped:0 overruns:0 frame:0
          TX packets:323 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:17190 (16.7 KiB)  TX bytes:18475 (18.0 KiB)
          Interrupt:2

eth1      Link encap:Ethernet  HWaddr 00:30:64:DD:AA:AB
          inet6 addr: fe80::230:64ff:fedd:aaab/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:114 errors:0 dropped:0 overruns:0 frame:0
          TX packets:223 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:7079 (6.9 KiB)  TX bytes:18726 (18.2 KiB)
          Interrupt:3

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:328 errors:0 dropped:0 overruns:0 frame:0
          TX packets:328 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:30462 (29.7 KiB)  TX bytes:30462 (29.7 KiB)

```

2. On the debug PC, execute the following commands to perform the upgrade.

```
cd BMC_MECS-6110_Release_Vx.xx
```

```
cd FW
```

```
./adlinktool.sh bmc1 rom.ima 11.0.0.11
```

3.15 BMC Firmware Update via Host with Yafuflash

The MECS-6110 supports a BMC Chassis Management firmware, IPMI v2.0 compliant. To update the BMC firmware via host with Yafuflash, perform the following steps.

1. Login to the OS with root user permission.
2. Update the BMC over host using the commands below:

Example:

```
$ sudo ./Yafuflash -kcs rom.ima
```

```
YAFUFlash - Firmware Upgrade Utility (Version 4.117.7)
```

```
-----
(C)Copyright 2016, American Megatrends Inc.
The Module root allocated size is different from the one in the Image
So,Type (Y/y) to do Full Firmware Upgrade or (N/n) to exit
Enter your Option : Y
```

```
*****
WARNING!
      FIRMWARE UPGRADE MUST NOT BE INTERRUPTED ONCE IT IS STARTED.
      PLEASE DO NOT USE THIS FLASH TOOL FROM THE REDIRECTION CONSOLE.
*****
```

```
Uploading Firmware Image : 100%... done
Skipping [boot] Module ....
Flashing [conf] Module ....
Flashing Firmware Image : 100%... done
Verifying Firmware Image : 100%... done
Flashing [root] Module ....
Flashing Firmware Image : 100%... done
Verifying Firmware Image : 100%... done
Flashing [osimage] Module ....
Flashing Firmware Image : 100%... done
Verifying Firmware Image : 100%... done
Flashing [www] Module ....
Flashing Firmware Image : 100%... done
Verifying Firmware Image : 100%... done
Flashing [testapps] Module ....
Flashing Firmware Image : 100%... done
Verifying Firmware Image : 100%... done
Flashing [ast2500e] Module ....
Flashing Firmware Image : 100%... done
Verifying Firmware Image : 100%... done
Resetting the firmware.....
```

```
-----
Open IPMI Drivers
```

```
-----
Loading Open IPMI Driver:ipmi_devintf
BMC is booting up, Please load ipmi_si Open IPMI Driver after the BMC
Boots up!!!!
Loading Open IPMI Driver:ipmi_msghandler
```

3.16 Enter BIOS Setup

To enter the BIOS setup screen, follow these steps:

1. Power on the MECS-6110.
2. Press the <Delete> or <ESC> key on your keyboard when you see the following text prompt: "Press DEL or ESC to enter Setup".
(Note: If Quick Boot is enabled, the screen below will not display, but pressing the <Delete> or <ESC> key will still allow you to enter the BIOS setup screen.)



3. After pressing the <Delete> or <ESC> key, the main BIOS setup menu will display. You can access the other setup screens from the main BIOS setup menu, such as Chipset and Power menus.

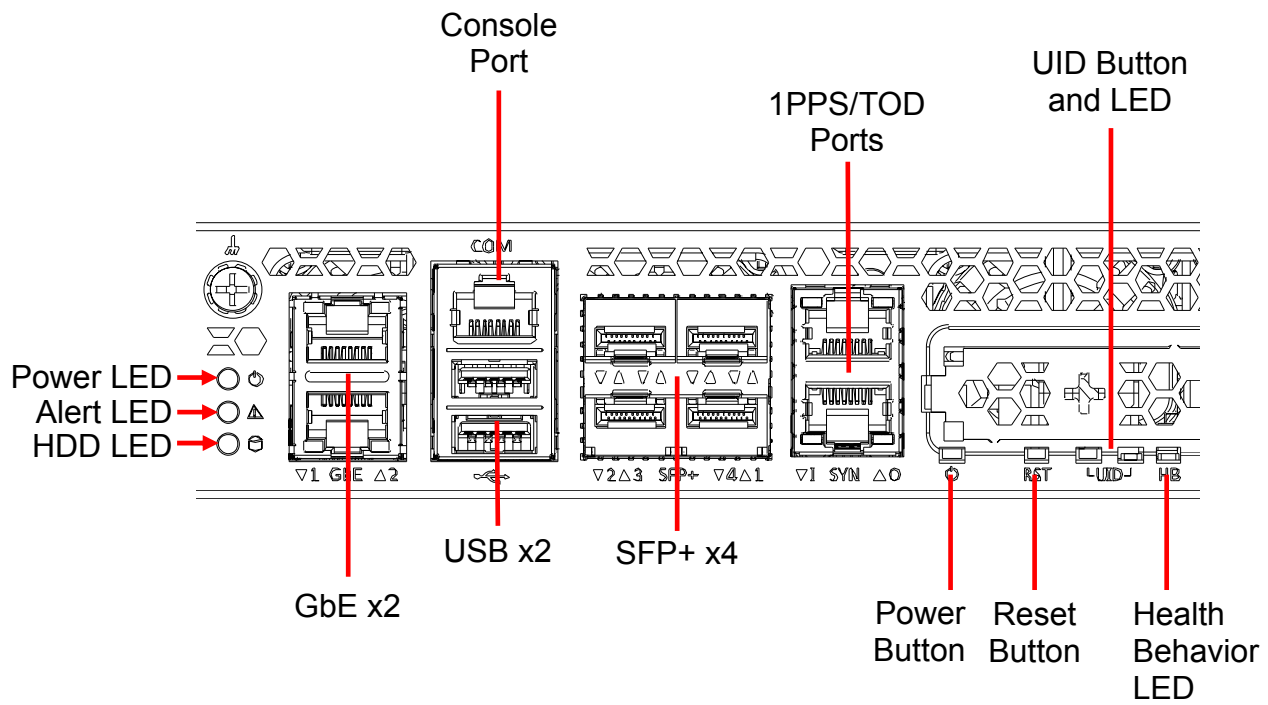
3.17 Clear CMOS

See 4.9 *Board Layout* on page 50 for the location of the Clear CMOS jumper (CN25).

CN25	Setting
1-2	default
2-3	Clear CMOS

4 System Interfaces

4.1 Front Panel I/O



4.2 Status LEDs and Buttons

Power LED (green)

The Power LED will light when the system is booted up (S0 state).

Alert LED (red)

Off: Indicates normal system operation. On: Indicates a critical alarm.

Drive Activity (HDD) LED (yellow)

The Drive Activity (HDD) LED is controlled by SATALED# from the chipset. When SATA storage is active (read/write), the LED will blink.

Note: This LED can also be user defined. Refer to *4.7 HDD/User LED Jumper* and *4.8 User LED Commands* on page 48.

UID Button and LED (blue)

The UID button/indicator is used to conveniently locate the server. The LED can be turned off or on manually by pressing the UID button or remotely controlled by management command.

Health Behavior LED (green/red)

The Health Behavior LED has the following behavior.

1. Default: Green (blinking) indicates healthy BMC status.
2. Override: User can use the OEM LED command (LED1/LED2) to override the LED status to reflect the system health status.

Power Button

The behaviour of the power buttons is as follows:

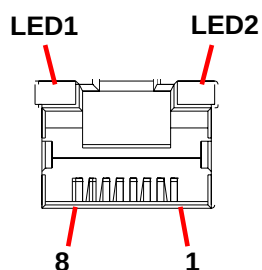
1. When system is powered on, pressing the button briefly will trigger the OS to perform a graceful shut down.
2. When system is powered on, pressing the button for ≥ 4 seconds will trigger a hard shut down.
3. When system is powered off, pressing the button briefly will power on the system.

Reset Button

Pushing the reset button will trigger a cold reset of the system.

4.3 LAN Ports

Pin #	Signal
1	MDI_P0
2	MDI_N0
3	MDI_P1
4	MDI_N1
5	MDI_P2
6	MDI_N2
7	MDI_P3
8	MDI_N3



LAN LED Behaviour

The LAN LEDs are integrated into the RJ-45 connector. Their behavior is as follows:

The LED1 (Speed) indicates the speed of the LAN connection.

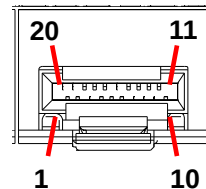
LED1 (Speed)	
10 Mbps	Off
100 Mbps	Green
1000 Mbps	Orange

The LED2 (Link/Activity) indicates that a link has been established by lighting orange. When data is transmitted the LED blinks orange.

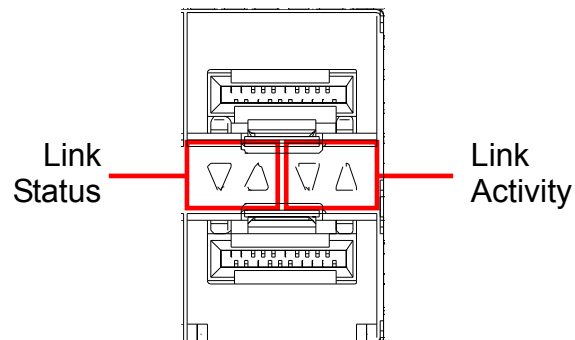
LED2 (Link/Activity)	
Link with no activity	Steady
Link with activity	Blinking

4.4 SFP+ Ports

Pin	Signal Name
1	GND
2	TX_FAULT
3	TX_DSBL
4	SDA
5	SCL
6	MOD_ABS
7	RS0
8	RX_OS
9	RS1
10	GND
11	GND
12	RD-
13	RD+
14	GND
15	VCCR
16	VCCT
17	GND
18	TX+
19	TX-
20	GND



SFP+ LED Behaviour

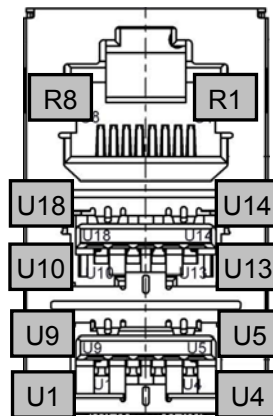


The LEDs point to the respective port.

LED	Status	Behavior
Link Status	Link up	Yellow (steady)
	Link down	Off
Link Activity	Active	Green (blinking)
	Not active	Off

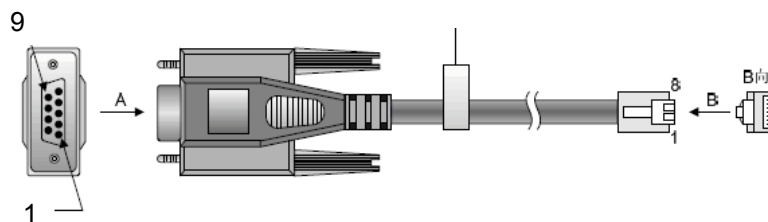
4.5 Dual USB 3.0 and RJ-45 Console Port

Pin	Signal Name
R1	N/C
R2	N/C
R3	COM_TXD
R4	GND
R5	GND
R6	COM_RXD
R7	N/C
R8	N/C
U1	5V
U2	USB2_N
U3	USB2_P
U4	GND
U5	SSRX_N
U6	SSRX_P
U7	GND
U8	SSTX_N
U9	SSTX_P
U10	5V
U11	USB2_N
U12	USB2_P
U13	GND
U14	SSRX_N
U15	SSRX_P
U16	GND
U17	SSTX_N
U18	SSTX_P



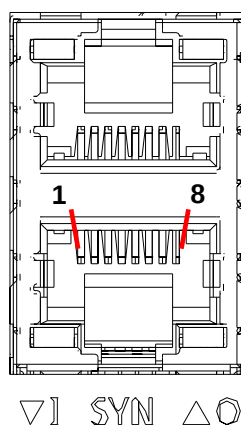
The MECS-6110 comes with an RJ-45 to DB-9 console port adapter cable.

DB-9 Pin	Signal
1	—
2	RXD
3	TXD
4	DTR
5	SG
6	DSR
7	RTS
8	CTS
9	—



4.6 1PPS/TOD Connector

Pin #	Signal (Upper)	Signal (Lower)
1	NC	NC
2	NC	NC
3	1PPS_TXD_N	1PPS_RXD_N
4	GND	GND
5	GND	GND
6	1PPS_TXD_P	1PPS_RXD_P
7	TOD_TXD_N	TOD_RXD_N
8	TOD_TXD_P	TOD_RXD_P



4.7 HDD/User LED Jumper

The HDD/User LED Jumper (CN39) can be used to set the function of the Drive Activity LED (default is Drive Activity).

CN25	Setting
1-2	SATA Drive Activity (default)
2-3	User Defined

4.8 User LED Commands

4.8.1 OEM ADLINK Set LED Status

NetFn=2Eh, Cmd=10h

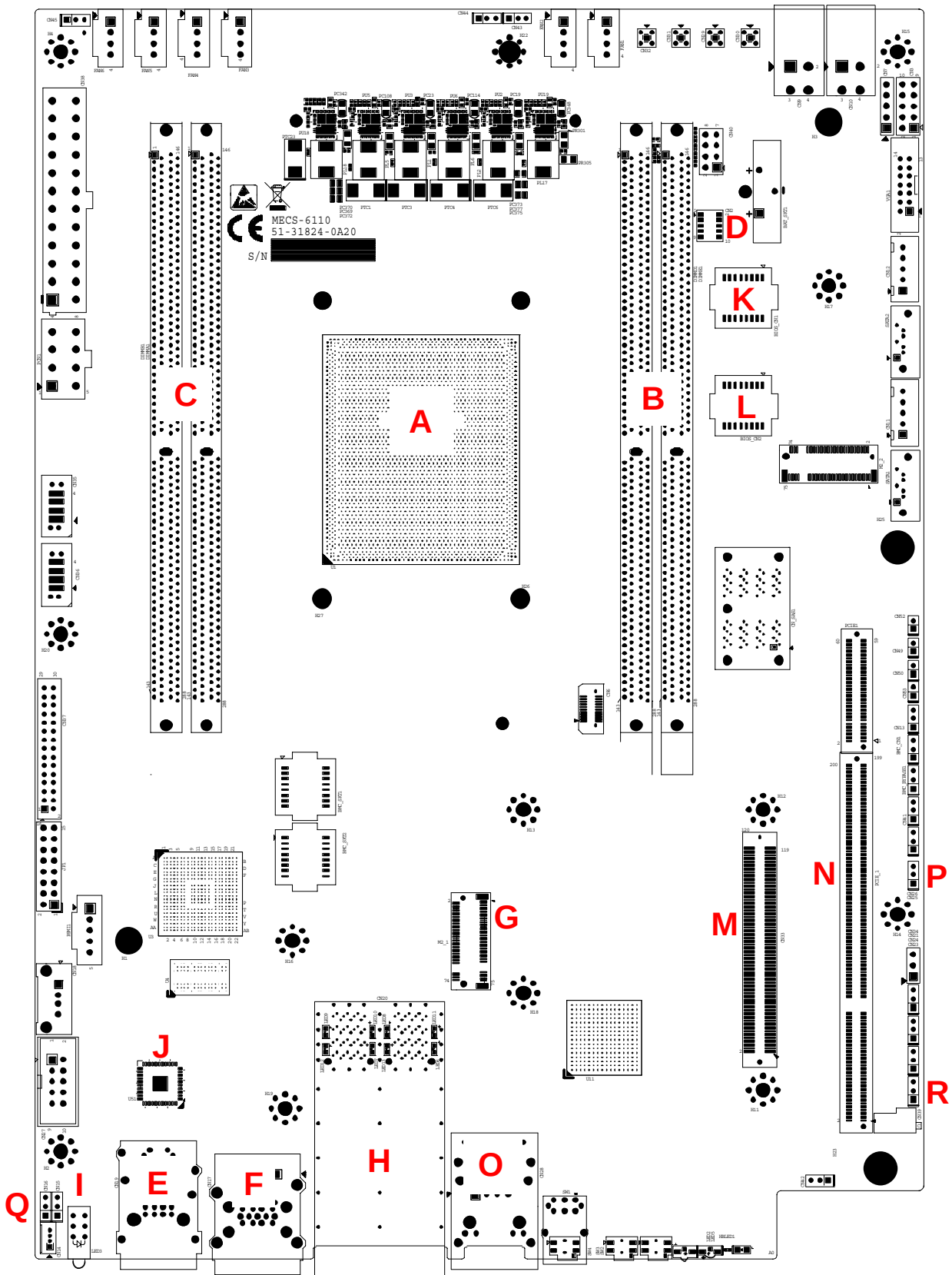
Byte	Data Field
1-3	ADLINK Manufacturer ID – 005F13h, LS byte first.
4	LED ID: 01h= UID LED (blue) 02h = USR LED (yellow, HDD shared) 03h = Alert LED (red) 04h = LED1 (green) 05h = LED2 (red) Other values: reserved
5	LED Function: 00h = LED OFF override. 01h - 1Eh = LED BLINKING override. The off duration is specified by the value of this byte, and the on duration is specified by the value of byte 5. Both values specify the time in hundreds of milliseconds (100 ms-3 s). 1Fh = LED state is restored to Local Control state 20h-FEh Reserved FF = LED ON override
6	On-duration: The LED on-time in hundreds of milliseconds if (01h Byte 6 1Eh) and ignored otherwise. Otherwise, this field is ignored and is set to 0h.
Response Field	
1	Completion Code
2-4	ADLINK Manufacturer ID – 005F13h, LS byte first.

4.8.2 OEM ADLINK Get LED Status

NetFn=2Eh, Cmd=11h

Byte	Data Field
1-3	ADLINK Manufacturer ID – 005F13h, LS byte first.
4	LED ID: 01h= UID LED (blue, UID led) 02h = USR LED (yellow, HDD shared) 03h = Alert LED (red) 04h = LED1 (green, default blink) 05h = LED2 (red, default off) Other values: reserved
Response Field	
1	Completion Code
2-4	ADLINK Manufacturer ID D of ran, LS byte first.
5	LED ID: 01h= UID LED (blue) 02h = USR LED (yellow, HDD shared) 03h = Alert LED (red) 04h = LED1 (green, default blink) 05h = LED2 (red) Other values: reserved
6	LED Function: 00h = LED OFF override. 01h - 1Eh = LED BLINKING override. The off duration is specified by the value of this byte, and the on duration is specified by the value of byte 7. Both values specify the time in hundreds of milliseconds (100 ms-3 s). 1Fh = LED is in Local Control state 20h-FEh Reserved FF = LED ON override
7	On-duration : The LED on-time in hundreds of milliseconds if (01h Byte 6 1Eh) and ignored otherwise set to 0h.

4.9 Board Layout



A	Intel® Xeon® D-2100 SOC	J	Intel® i210-IT GbE Controller
B	DDR4 Socket 1	K	Secondary BIOS SPI Flash
C	DDR4 Socket 2	L	Primary BIOS SPI Flash
D	Debug Port (Port 80)	M	OCP Connectors
E	BMC/MECS-6110 LAN RJ-45	N	PCIe x32 Connector
F	Console Port RJ-45 + USB 3.0	O	1PPS+TOD Ports
G	M.2 Slot	P	Clear CMOS Jumper (CN25)
H	SFP+ Connectors	Q	BMC Mode Jumpers (CN15/16)
I	Status LEDs	R	HDD/User LED Jumper (CN39)

5 BIOS Setup

5.1 BIOS Setup Menu

The BIOS setup utility is invoked by pressing <ESC> or keys. User can change BIOS settings during setup utility runs. A system reset is required for new settings to take effect.

In the BIOS setup utility, there are several hot keys are designed for specific purposes, as listed below.

- <F1>: General help in setup menu
- <F8>: Load previous BIOS values
- <F9>: Load BIOS default in setup utility
- <F10>: Save & Exit setup utility

To navigate through the BIOS setup menu, use the following.

→←	Left/Right. The <i>Left and Right</i> < Arrow > keys allow you to select a setup screen. For example: Main screen, Advanced screen, Chipset screen, and so on.
↑↓	Up/Down The <i>Up and Down</i> < Arrow > keys allow you to select a setup item or sub-screen.
+ -	Plus/Minus The <i>Plus and Minus</i> < 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.

5.1.1 Menu Selection Bar

The Menu Selection Bar is located at the top of the screen. It displays the top level available menus to the user:

- Main Menu
- Advanced Menu
- Platform Configuration Menu
- Server Mgmt
- Security Menu
- Boot Menu
- Save & Exit Menu

5.1.2 Menu Conventions

The appearance of the setup menu listed in this chapter is a sample to describe the item list. It is shown on a VT100 terminal via serial console. The menu conventions are as follows.

Using color

The mandatory BIOS setup fields are in black. The BIOS setup fields currently not used are in grey. The display only strings are in black.

Using brackets

Editable menu options are marketed with squares '[' and ']' to distinguish them from display only fields that can't be modified.

5.2 Main Menu

The Main Menu provides read-only information about the system and also allows you to set the system date and time. The tables below show screen shots of the Main menu details, submenus and settings.

```

Aptio Setup Utility - Copyright (C) 2021 American Megatrends, Inc.
Main Advanced Chipset Security Boot Save & Exit Server Mgmt
+-----+-----+-----+
| BIOS Information                                     ^|Set the Date. Use Tab ^|
| BIOS Vendor          American Megatrends          *|to switch between Date *|
| BIOS Version         1.04.10                      *|elements.                *|
| Build Date           04/09/2021                   *|Default Ranges:         *|
| MRC Version          2.2.0                        *|Year: 1900-9999         *|
| SPS FW Version       0E:4.0.4.97                  *|Months: 1-12           +|
|                                                              *|Days: dependent on month+|
| System Information                                     *|                          v|
| Project Name         MECS-6110                    *|                          |
| CPU Brand String     Intel(R) Xeon(R) D-2177       *|-----+-----+-----+
|                               NT CPU @ 1.90GHz       *|><: Select Screen      |
| CPU Frequency        1.90GHz                      *|^v: Select Item        |
| Total Memory         16384 MB                     *|Enter: Select         |
| Memory Frequency     2400 MHz                     *|+/-: Change Opt.      |
|                               *|F1: General Help          |
| System Date          [Wed 04/14/2021]              *|F8: Previous Values   |
| System Time          [15:06:36]                   +|F9: Optimized Defaults|
|                               v|F10: Save & Exit          |
|                               |ESC: Exit              |
+-----+-----+-----+
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```

5.2.1 BIOS Information

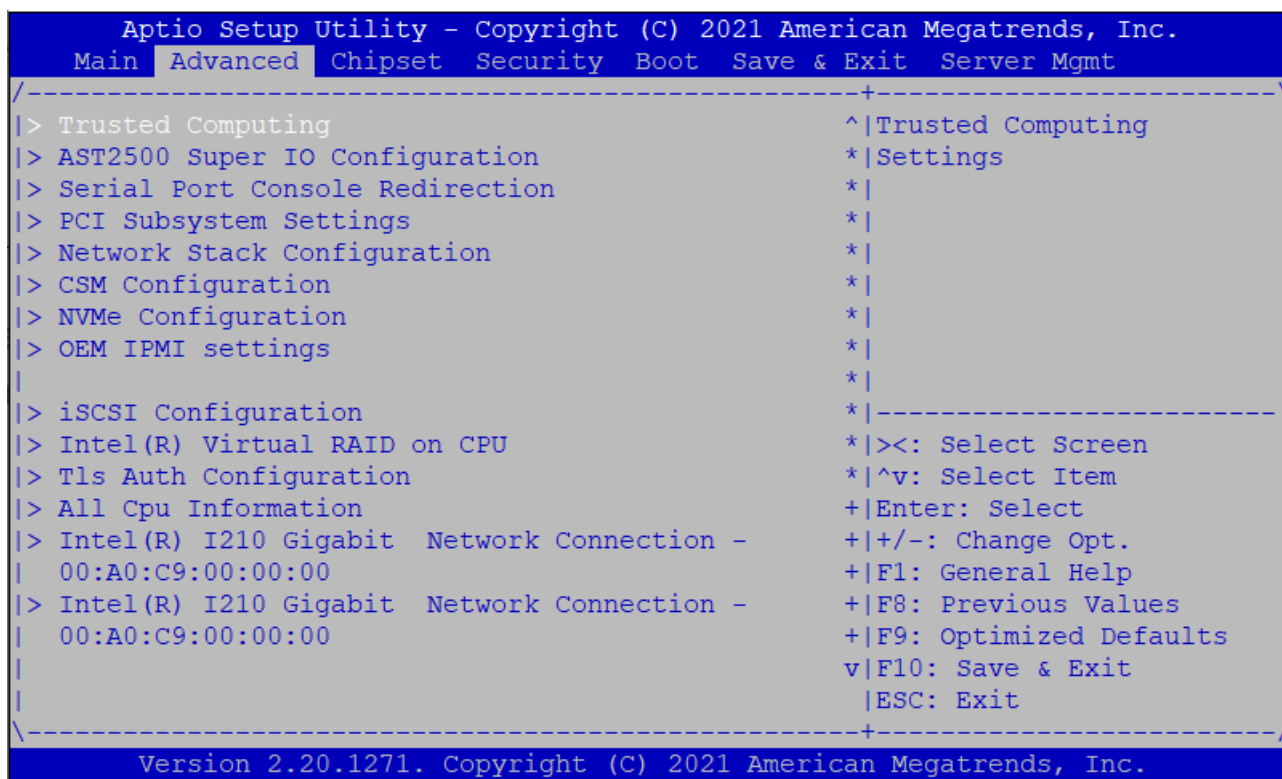
BIOS Item	Options	Description
BIOS Vendor	Info-only. American Megatrends	Display vendor name of system BIOS.
BIOS Version	Info-only. x.yy.zz	Display version of booting BIOS.
Build Date	Info-only. MM/DD/YYYY	It shows the date that BIOS was built.
MRC Version	Info-only. xxx.Ryy	Display the revision of MRC code which is implemented in BIOS.
SPS FW Version	Info-only. ww:x.y.z.aaa	Display the version of Intel manageability firmware which is implemented in BIOS.

5.2.2 System Information

BIOS Item	Options	Description
Project Name	Info-only.	It shows Project Name
CPU Brand String	Info-only. Intel(R) Core, ...	It shows what CPU is booting the system.
CPU Frequency	Info-only. XXXX MHz	It shows CPU's frequency.
Total Memory	Info-only. XXXX MB (DDR4)	It shows total memory size used on the motherboard and memory type.
Memory Frequency	Info-only. XXXX MHz	It shows memory's frequency.
System Date	MM/DD/YYYY	For configuring/showing system date. When setting the Date, use <Tab> key to switch between Date elements.
System Time	HH:MM:SS	For configuring/showing system time. When setting the Time, use <Tab> key to switch between Time elements.
Access Level	Info-only. Administrator/User	It shows what access level is used to enter BIOS setup menu.

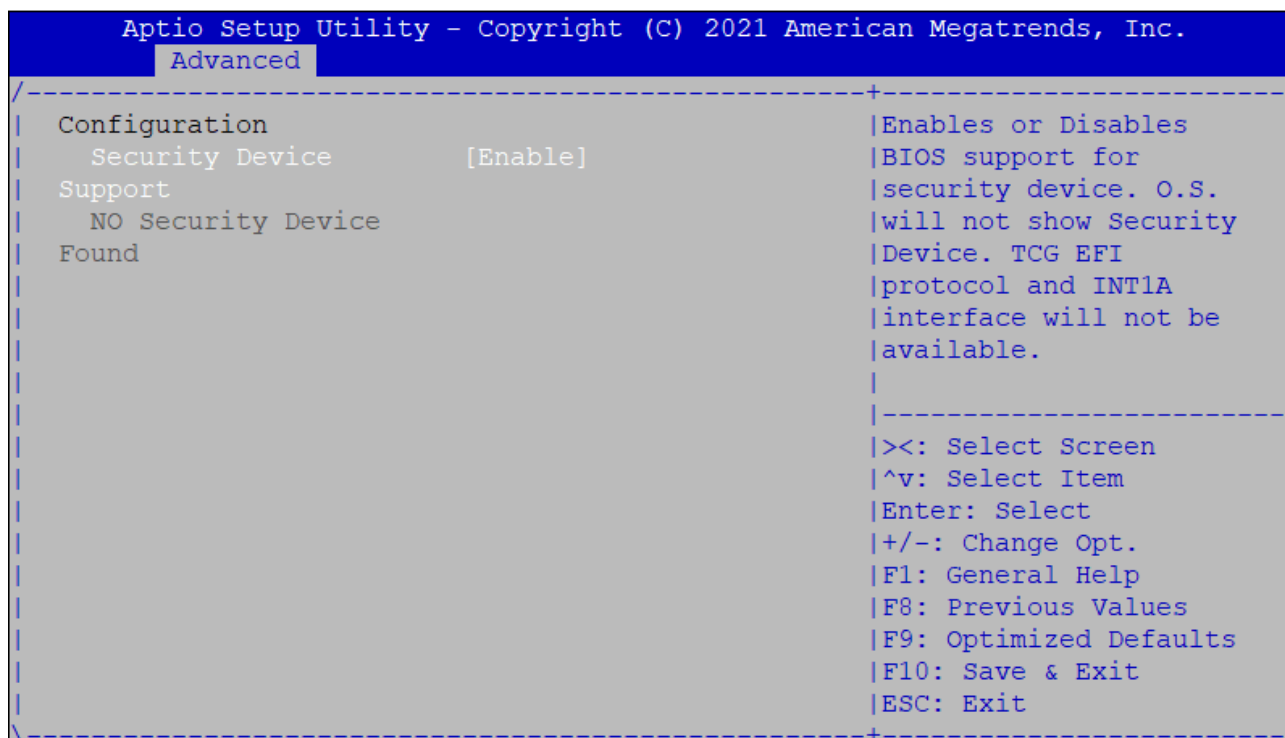
5.3 Advanced Menu

This menu contains the settings for most of the user interfaces in the system.



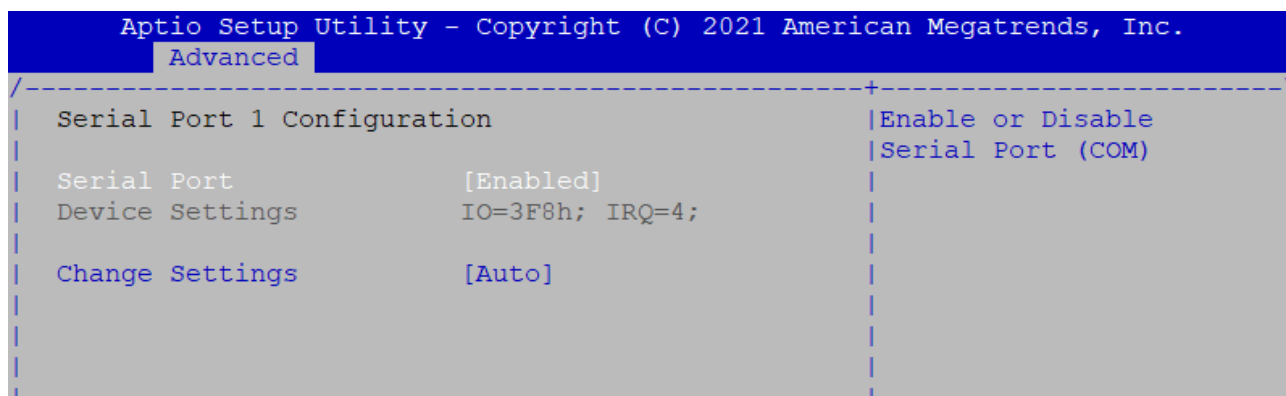
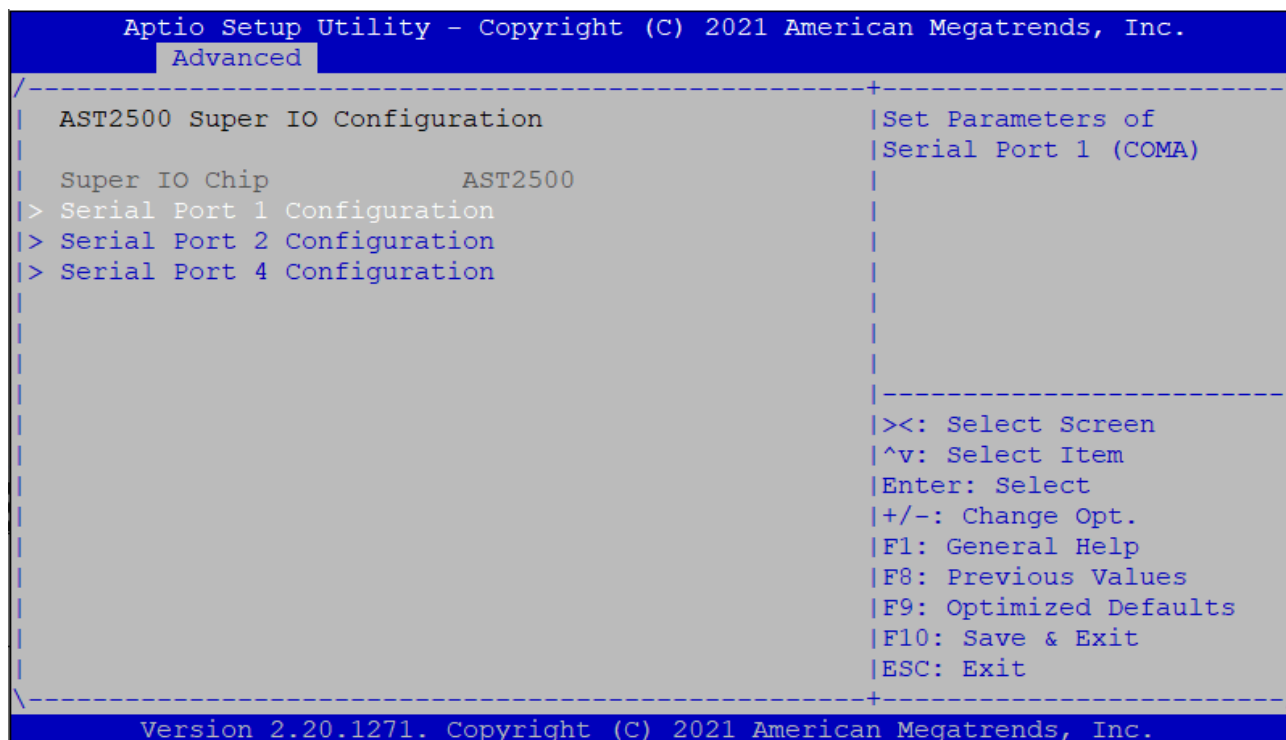
BIOS Item	Options	Description
Trusted Computing	Sub-Menu	For TPM setting
AST2500 Super IO Configuration	Sub-Menu	For System Super IO configuration
Serial Port Console Redirection	Sub-Menu	For configuring serial console.
PCI Subsystem Settings	Sub-Menu	PCI settings
Network Stack Configuration	Sub-Menu	For configuring Network Stack.
CSM Configuration	Sub-Menu	For CSM configuration
NVME Configuration	Sub-Menu	For NVME devices
OEM IPMI Settings	Sub-Menu	For OEM IPMI settings
iSCSI Configuration Intel(R) Virtual RAID on CPU Tls Auth Configuration All Cpu Information	No Detail	Dynamic page
Intel(R) I210 Gigabit Network Connection - ... Intel(R) Ethernet Connection X722 10Gb SFP+.....	Sub-Menu	Onboard Ethernet controller configuration loaded by EFI driver. The setup page designed by Intel and when running Ethernet EFI driver, this page will be shown. It is related to "Network" setting in Boot setup page.

5.3.1 Sub-Menu: Trusted Computing



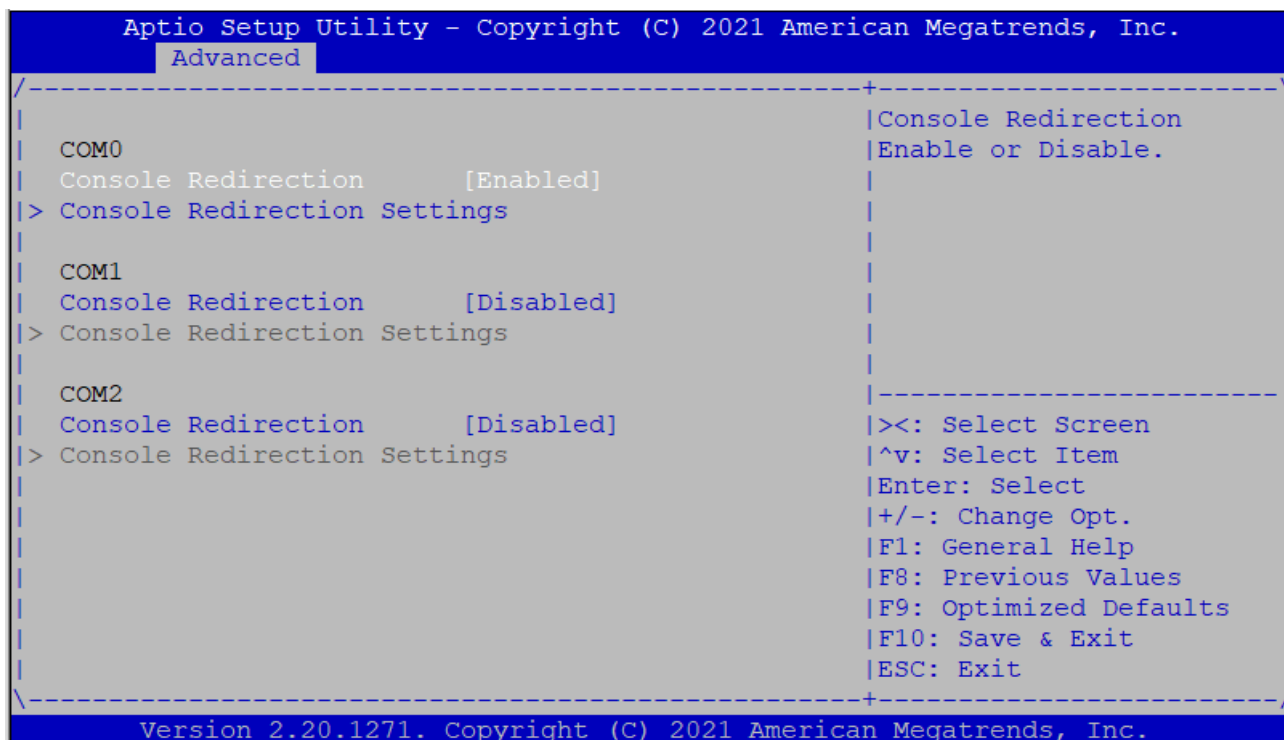
BIOS Item	Options	Description
Security Device	Disabled Enabled	Enable or Disable security device, such as TPM

5.3.2 Sub-Menu: AST2500 Super IO Configuration

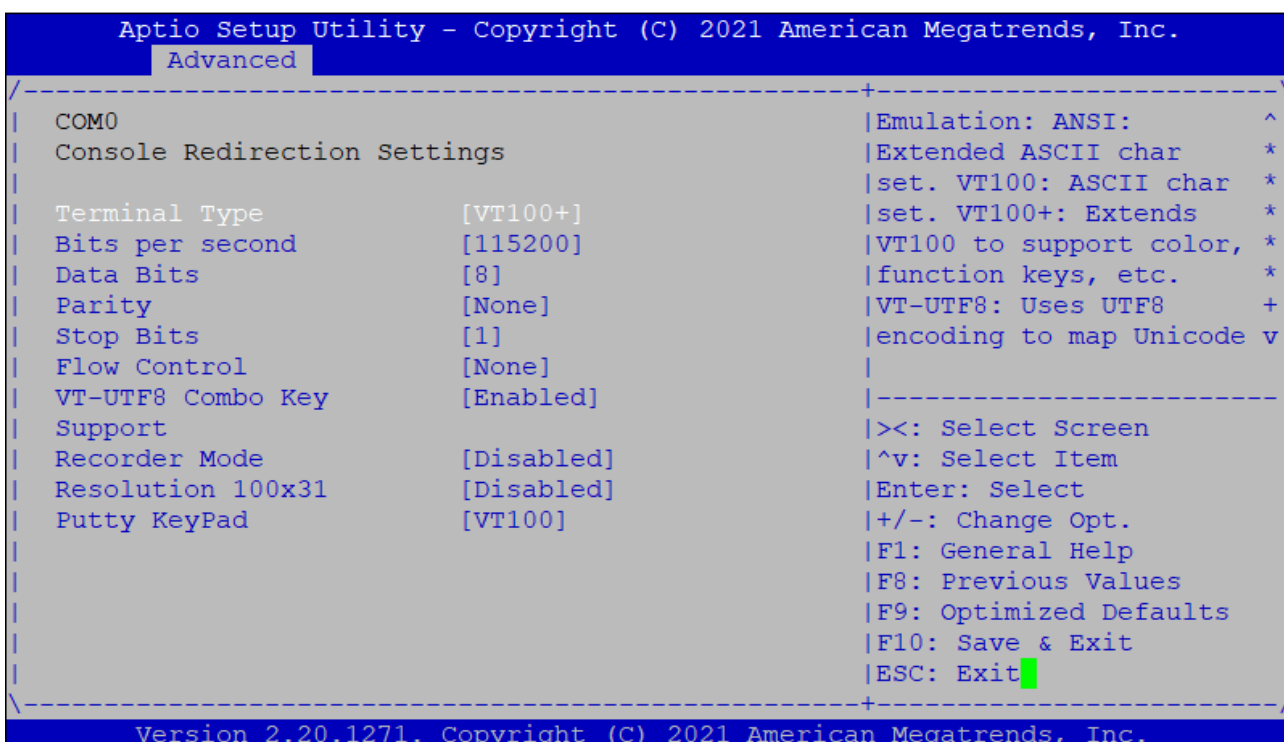


BIOS Item	Options	Description
Serial Port	Disabled Enabled	To enable or disable serial Port.
Device Settings	Info-only	Show serial port IO address and IRQ source
Change Settings	Auto IO=3F8h; IRQ=4; IO=3F8h;IRQ=3,4,5,6,7,9,10,11,12; IO=2F8h;IRQ=3,4,5,6,7,9,10,11,12; IO=3E8h;IRQ=3,4,5,6,7,9,10,11,12; IO=2E8h;IRQ=3,4,5,6,7,9,10,11,12;	Select optimal resource for SIO

5.3.3 Sub-Menu: Serial Port Console Redirection

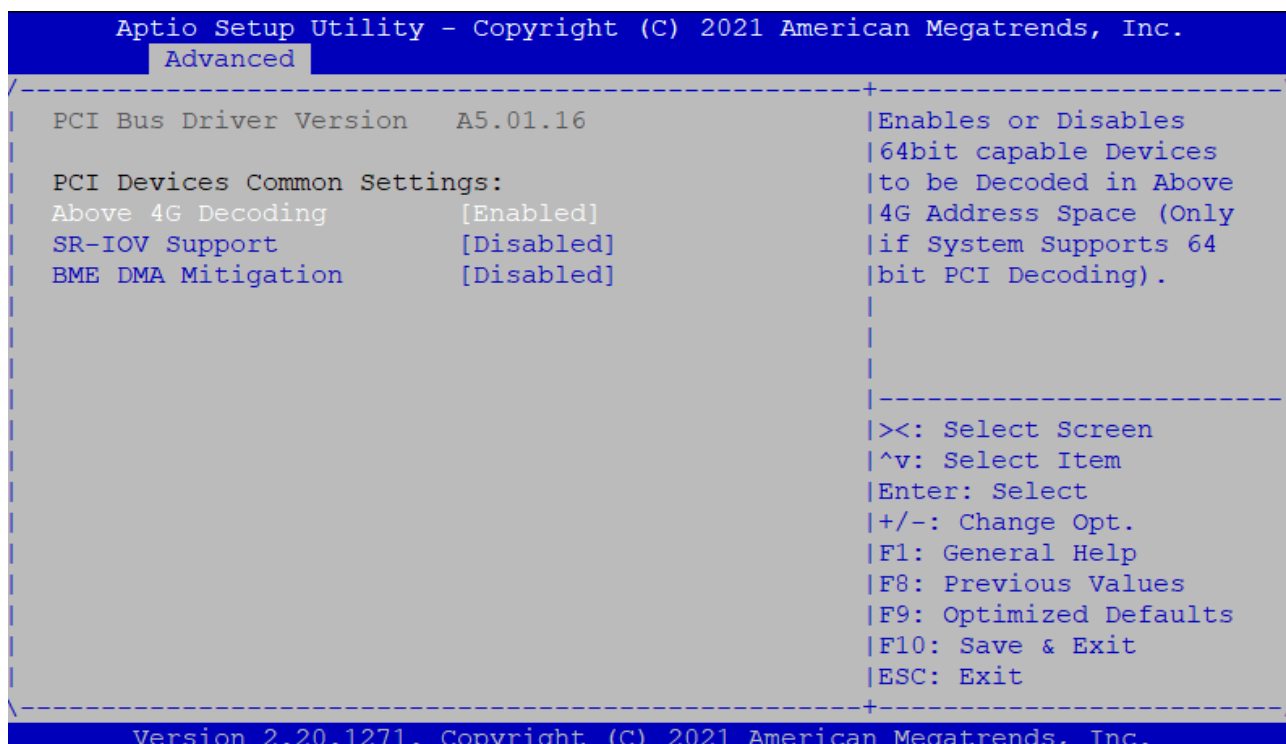


BIOS Item	Options	Description
Console Redirection	Enabled Disabled	Enable or disable serial port console redirection function.
Console Redirection Settings	Sub-Menu	For configuring serial port settings when console redirection function is enabled.



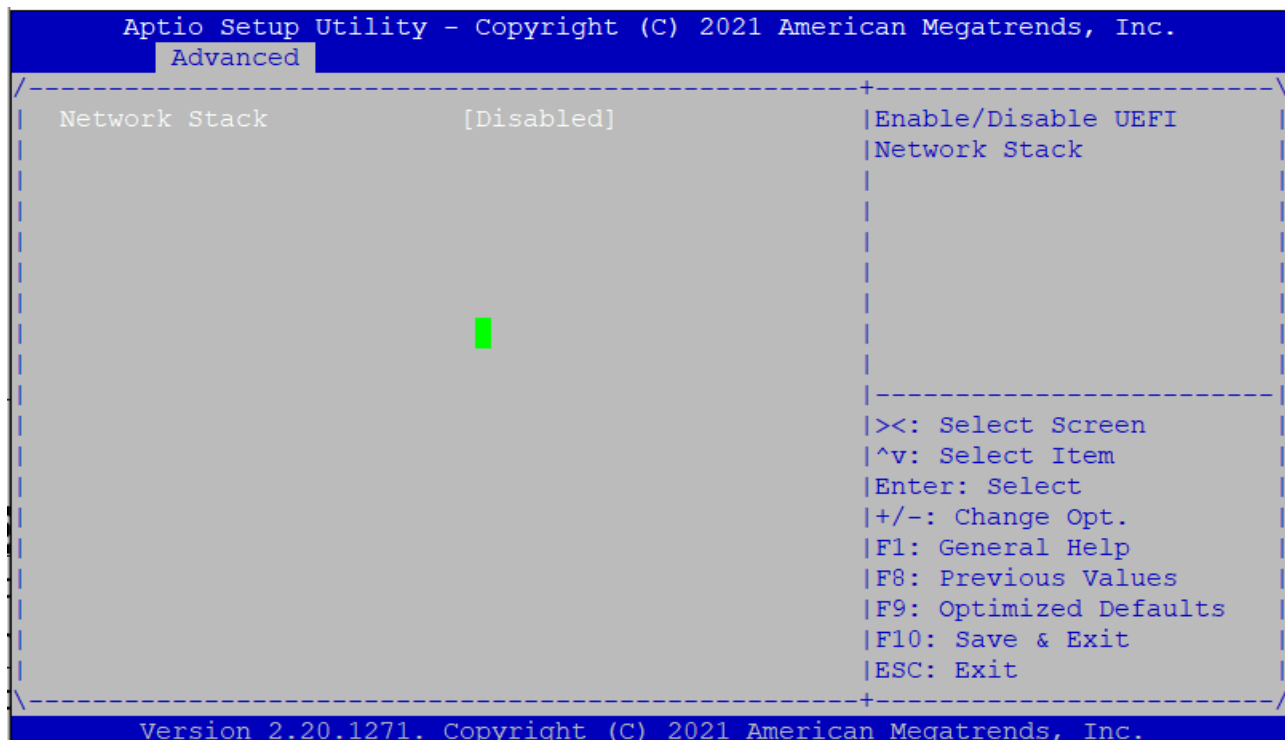
BIOS Item	Options	Description
Terminal Type	VT100 VT100+ VT-UTF8 ANSI	Configure the type of console emulation. Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.
Bits per second	9600 19200 38400 57600 115200	Selects serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speed.
Data Bits	7 8	Configure the number of data bits in each transmitted or received serial character for both serial ports.
Parity	None Even Odd Mark Space	Configures if parity bit is generated (transmit data) or checked. A parity bit can be sent with the data bits to detect some transmission errors. Even: parity bit is 0 if the num of 1's in the data bits is even. Odd: parity bit is 0 if num of 1's in the data bits is odd. Mark: parity bit is always 1. Space: Parity bit is always 0. Mark and Space Parity do not allow for error detection. They can be used as an additional data bit.
Stop Bits	1 2	Configures the number of stop bits transmitted and received in each serial character for both serial ports. 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.
Flow Control	None Hardware RTS/CTS	Configures flow control for console redirection. Hardware flow control uses RTC/CTS.
VT-UTF8 Combo Key Support	Disabled Enabled	Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals
Recorder Mode	Disabled Enabled	This mode only text will be sent
Resolution 100x31	Disabled Enabled	To enable or disable extended terminal resolutio
Putty Keypad	VT100	Select FunctionKey and keypad on Putty

5.3.4 Sub-Menu: PCI Subsystem Settings



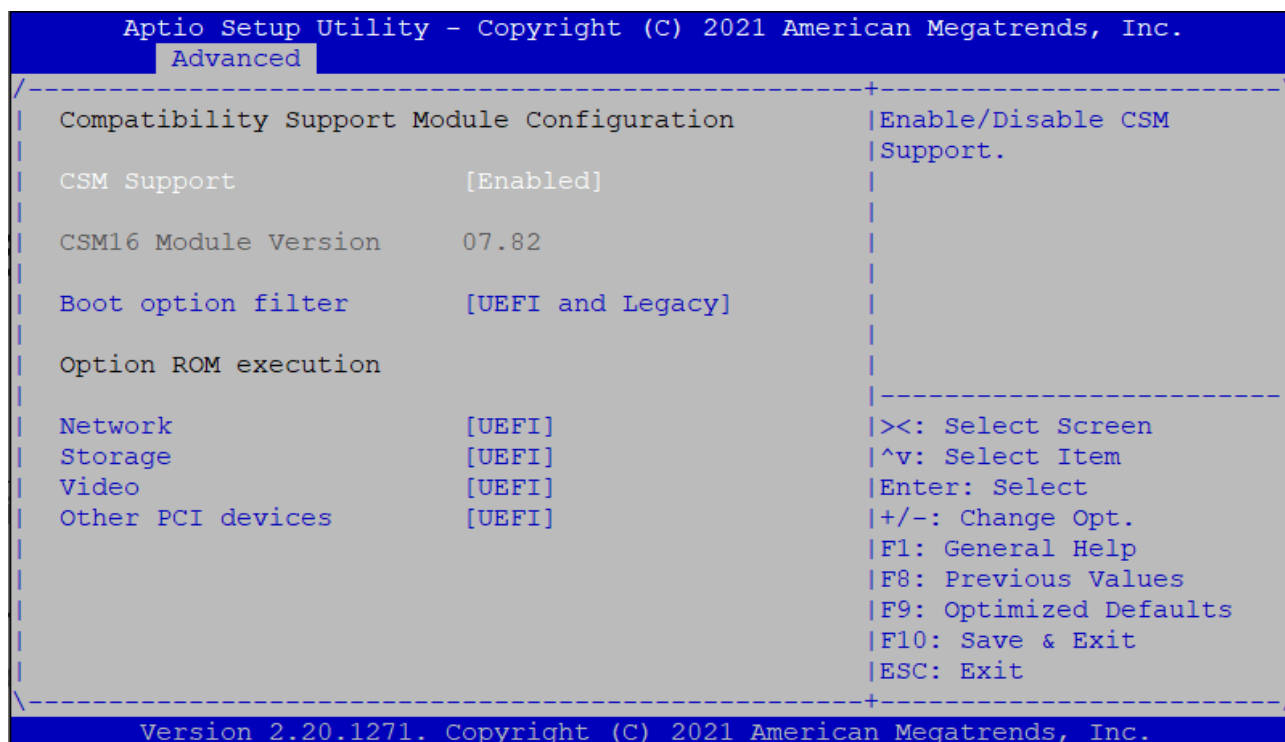
BIOS Item	Options	Description
Above 4G Decoding	Disabled Enabled	To enable or disable decoded in above 4G address Spacd.
SR-IOV Support	Disabled Enabled	Enable or disable Single Root IO virtualization support
BME DMA Mitigation	Disabled Enabled	Disable or enable Bus Master Attribute

5.3.5 Sub-Menu: Network Stack Configuration



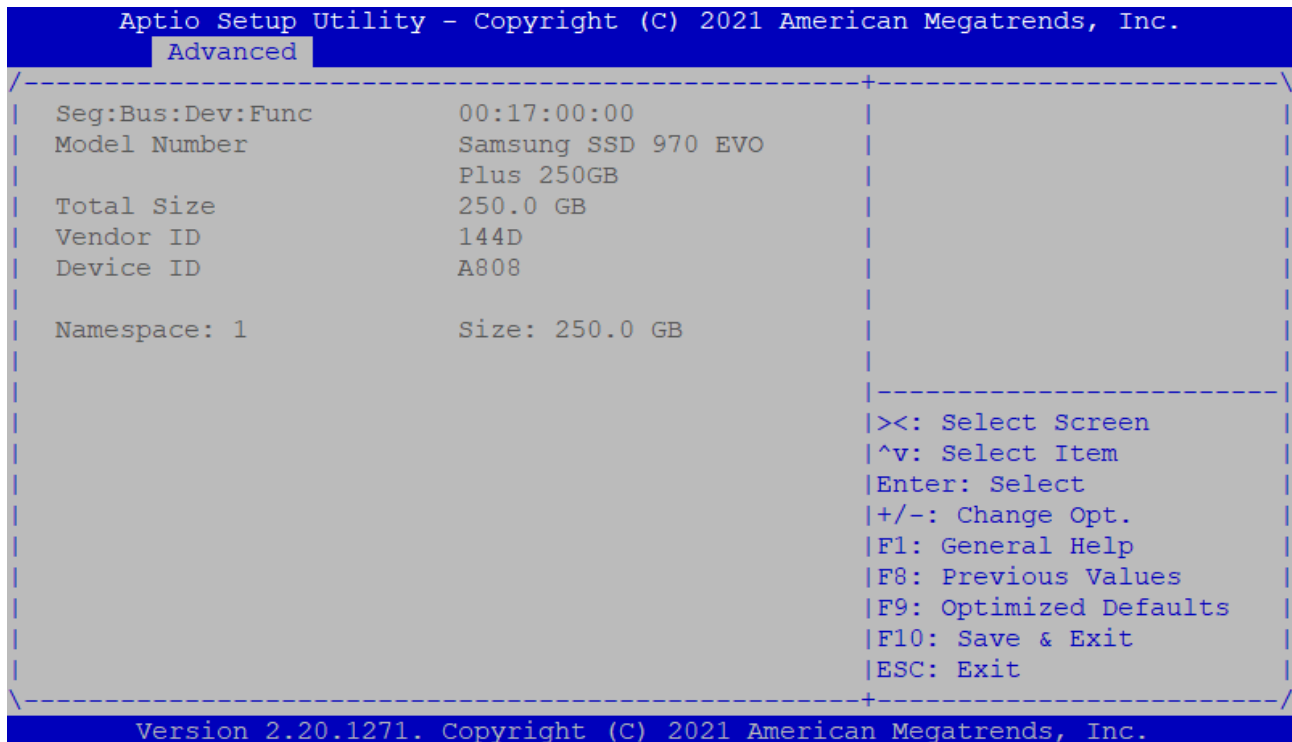
BIOS Item	Options	Description
Network Stack	Disabled Enabled	To enable or disable network stack.

5.3.6 Sub-Menu: CSM Configuration

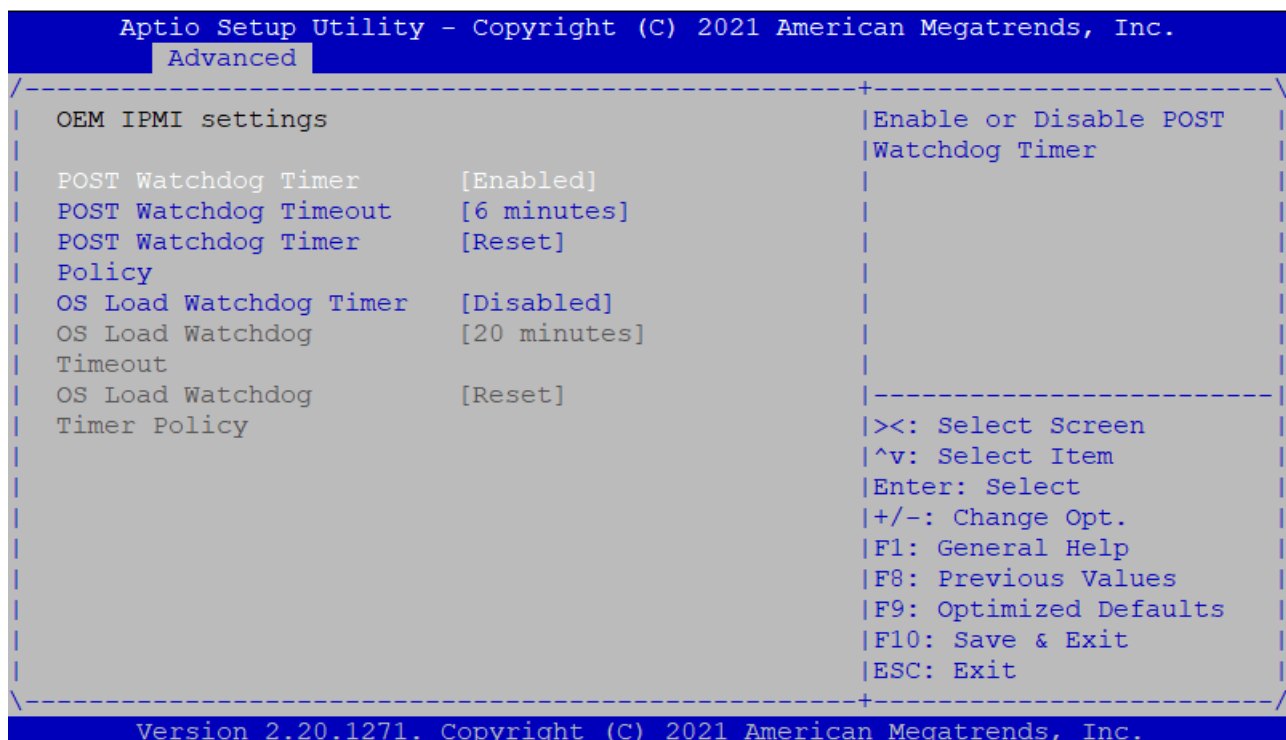


BIOS Item	Options	Description
CSM Support	Disabled Enabled	To enable or disable CSM Support.
CSM16 Module Version	Info Only	To show CSM module version
Boot option filter	UEFI and Legacy Legacy only UEFI only	Controls Legacy/UEFI Roms priority
Network	UEFI Legacy	Select the method of launch option ROM of network controller. UEFI will execute EFI driver and legacy will search option ROM of device to hook.
Storage	UEFI Legacy	Select the method of launch option ROM of storage controller. UEFI will execute EFI driver and legacy will search option ROM of device to hook.
Video	UEFI Legacy	Select the method of launch option ROM of graphic controller. UEFI will execute EFI driver and legacy will search option ROM of device to hook.
Other PCI devices	UEFI Legacy	Select the method of launch option ROM for devices other than Network, Storage, or Video

5.3.7 Sub-Menu: NVMe Configuration



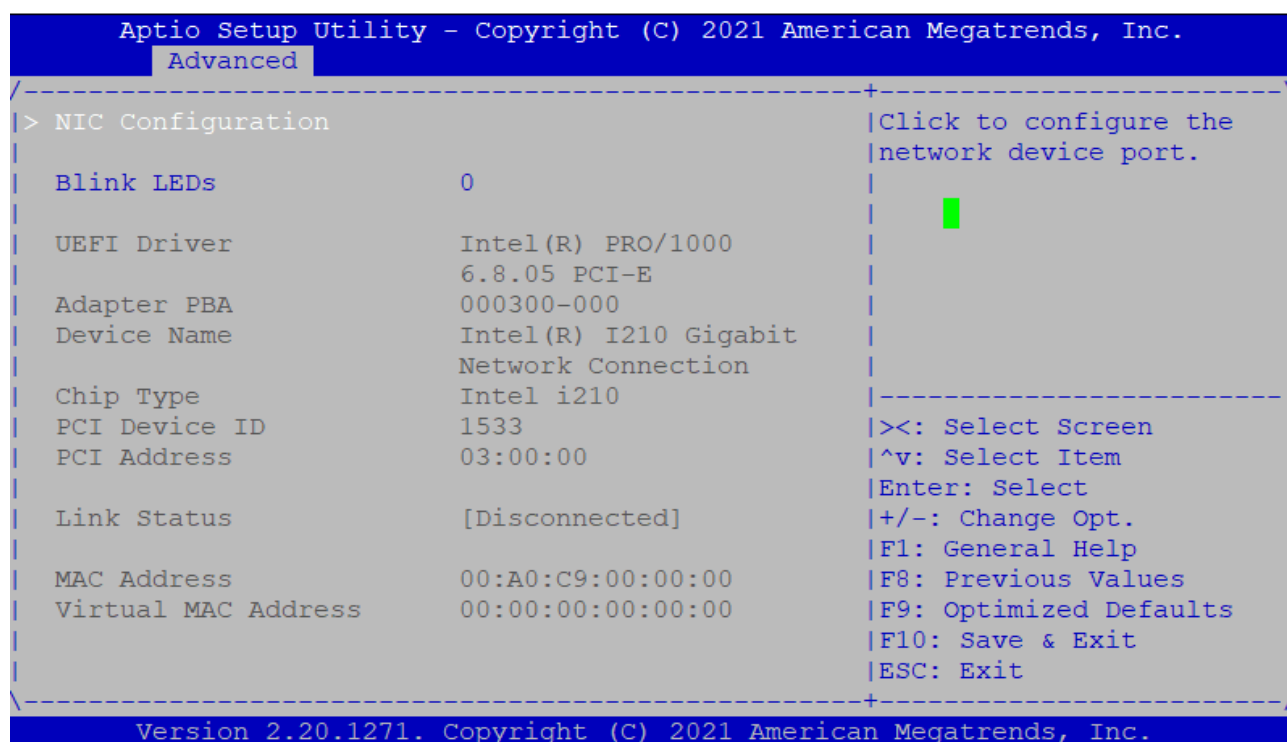
5.3.8 Sub-Menu: OEM IPMI Settings



BIOS Item	Options	Description
POST Watchdog Timer	Disabled Enabled	Enable or Disable POST watchdog timer
POST Watchdog Timeout	3 minutes 4 minutes 5 minutes 6 minutes	Select the time value for POST watchdog timer Expiration value
POST Watchdog Timer Policy	Do Nothing Reset Power Down	Configure how the system should respond if the POST Watchdog Timer expires.
OS load Watchdog Timer	Disabled Enabled	Enable/Disable OS Load watchdog timer.
OS load Watchdog Timeout	5 minutes 10 minutes 15 minutes 20 minutes	Select the time value of the OS Load Watchdog timer, not available if OS Load watchdog Timer is disabled
OS Load Watchdog Timer Policy	Do Nothing Reset Power Down	Configure how the system should respond if the OS Load Watchdog Timer expires.

5.3.9 Sub-Menu: Intel(R) I210 Gigabit Network Connection

This setup page is shown when “Network” setting in Boot page is set to “UEFI”. When the BIOS boots the system, it will launch the onboard Ethernet I210 controller’s UEFI driver. The driver provides a setup page for configuring Ethernet parameters and shows information about Ethernet controller. When the Ethernet’s UEFI driver is not executed, this setup page will not be shown.



BIOS Item	Options	Description
NIC Configuration		For configuring link speed and wake function.

5.3.10 Sub-Menu: Intel(R) Ethernet Connection X722 for 10GbE

```
Apdio Setup Utility - Copyright (C) 2021 American Megatrends, Inc.  
Advanced  
-----+  
> Firmware Image Properties | View device firmware  
> NIC Configuration       | version information.  
|                           |  
| Blink LEDs               | 0  
|                           |  
| UEFI Driver              | Intel(R) 40GbE 4.1.20  
| Adapter PBA              | 401500-000  
| Device Name              | Intel(R) Ethernet  
|                          | Connection X722 for  
|                          | 10GbE SFP+  
|                           | -----  
| Chip Type                | Intel X722          | <>: Select Screen  
| PCI Device ID            | 37D0                 | ^v: Select Item  
| PCI Address              | B8:00:00             | Enter: Select  
|                          |                       | +/-: Change Opt.  
| Link Status              | [Disconnected]        | F1: General Help  
|                          |                       | F8: Previous Values  
| MAC Address              | 00:00:00:00:03:14    | F9: Optimized Defaults  
| Virtual MAC Address      | 00:00:00:00:00:00    | F10: Save & Exit  
|                          | ESC: Exit  
|                          |  
-----+  
Version 2.20.1271. Copyright (C) 2021 American Megatrends, Inc.
```

BIOS Item	Options	Description
Firmware Image Properties	As below	View device firmware version
NIC Configuration		For configuring link speed and wake function.

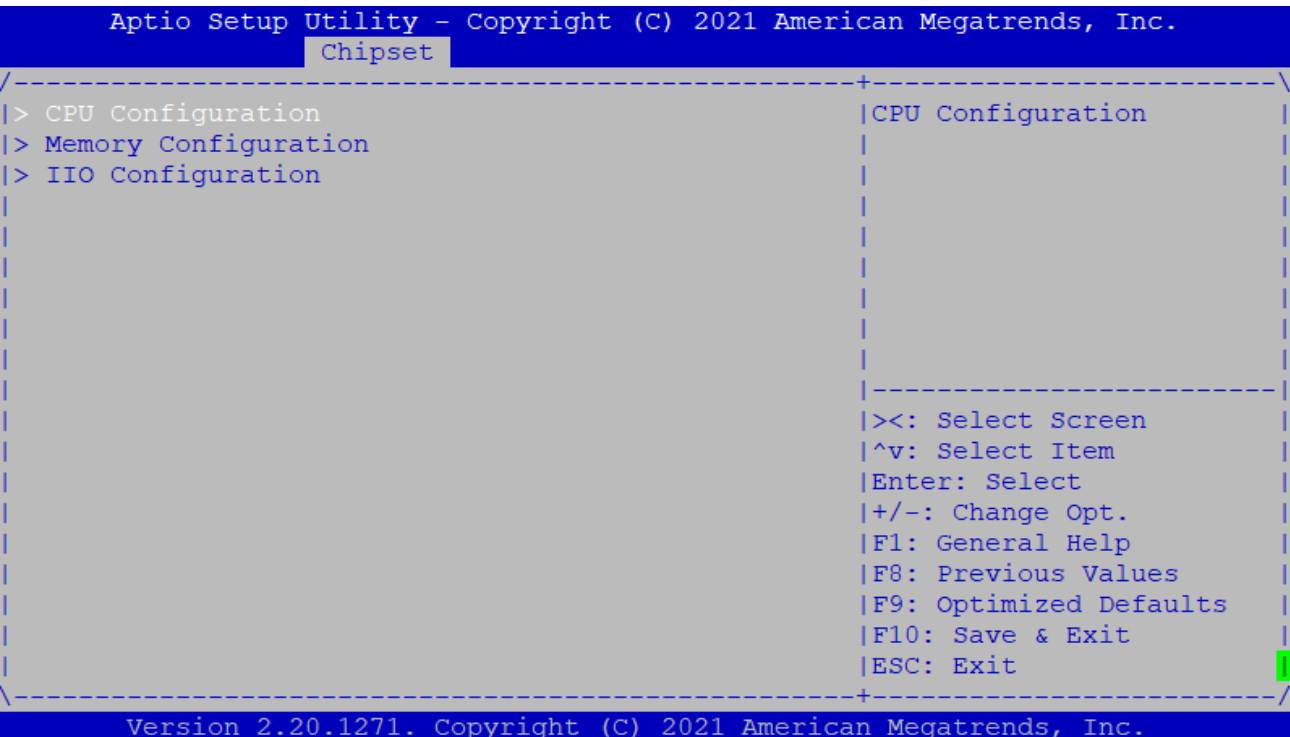
```

Aptio Setup Utility - Copyright (C) 2021 American Megatrends, Inc.
  Advanced
-----
Option ROM version          1.2684.0
Unique NVM/EEPROM ID       0x800002154
NVM Version                 4.30

><: Select Screen
^v: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F8: Previous Values
F9: Optimized Defaults
F10: Save & Exit
ESC: Exit
-----
Version 2.20.1271. Copyright (C) 2021 American Megatrends, Inc.

```

5.4.1 System Agent (SA) Configuration

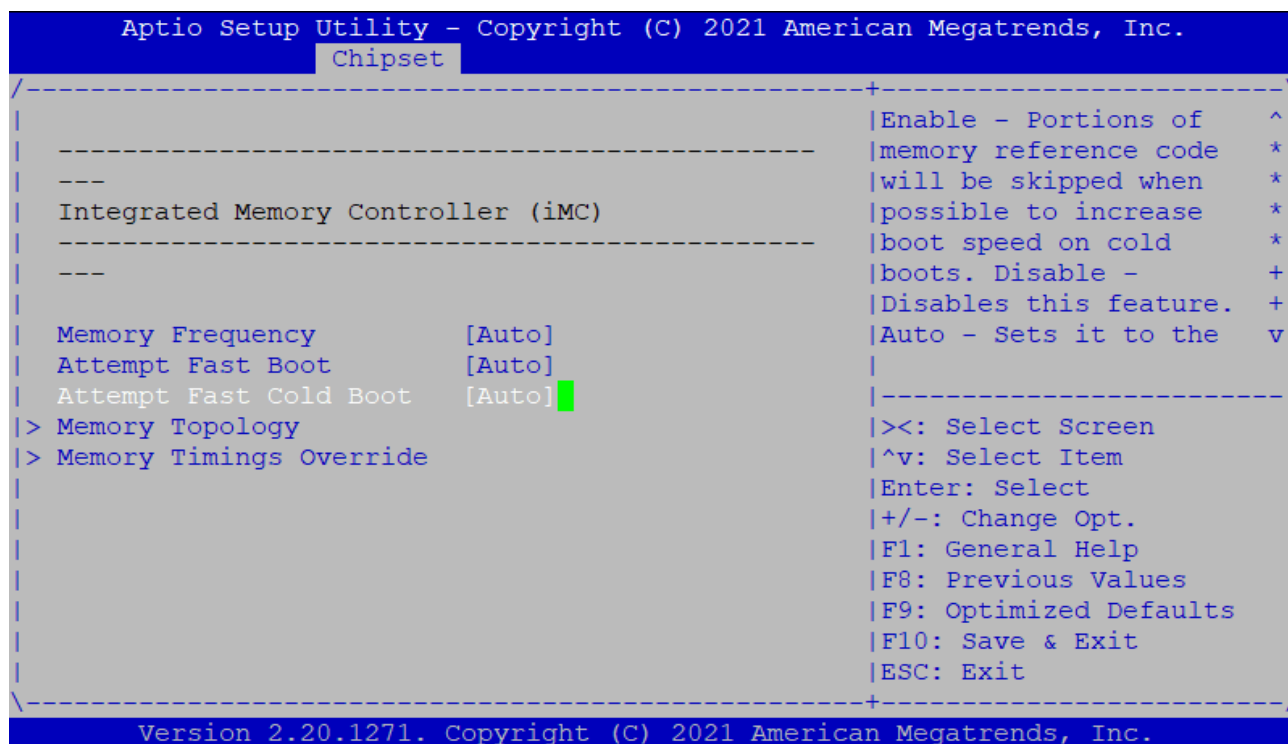


5.4.2 Sub-Menu: CPU Configuration

Aptio Setup Utility - Copyright (C) 2021 American Megatrends, Inc.			
Chipset			
Microcode Revision	0200005E		^ Enables Intel
L1 Cache RAM	64KB	0KB	+ Virtualization
L2 Cache RAM	1024KB	0KB	+ Technology, takes
L3 Cache RAM	19712KB	0KB	+ effect after reboot.
Processor Socket	Socket 2	Socket 3	+
Processor ID	00000000*	00000000	+
Processor Frequency	0.000GHz	0.000GHz	*
Processor Max Ratio	00H	00H	*
Processor Min Ratio	00H	00H	*
Microcode Revision	N/A	N/A	*
L1 Cache RAM	0KB	0KB	* > <: Select Screen
L2 Cache RAM	0KB	0KB	* ^v: Select Item
L3 Cache RAM	0KB	0KB	* Enter: Select
Processor 0 Version	Intel(R) Xeon(R) D-2177		* +/-: Change Opt.
	NT CPU @ 1.90GHz		* F1: General Help
Hyper-Threading [ALL]	[Disable]		* F8: Previous Values
Intel Virtualization	[Enable]		* F9: Optimized Defaults
Technology			v F10: Save & Exit
			ESC: Exit
Version 2.20.1271. Copyright (C) 2021 American Megatrends, Inc.			

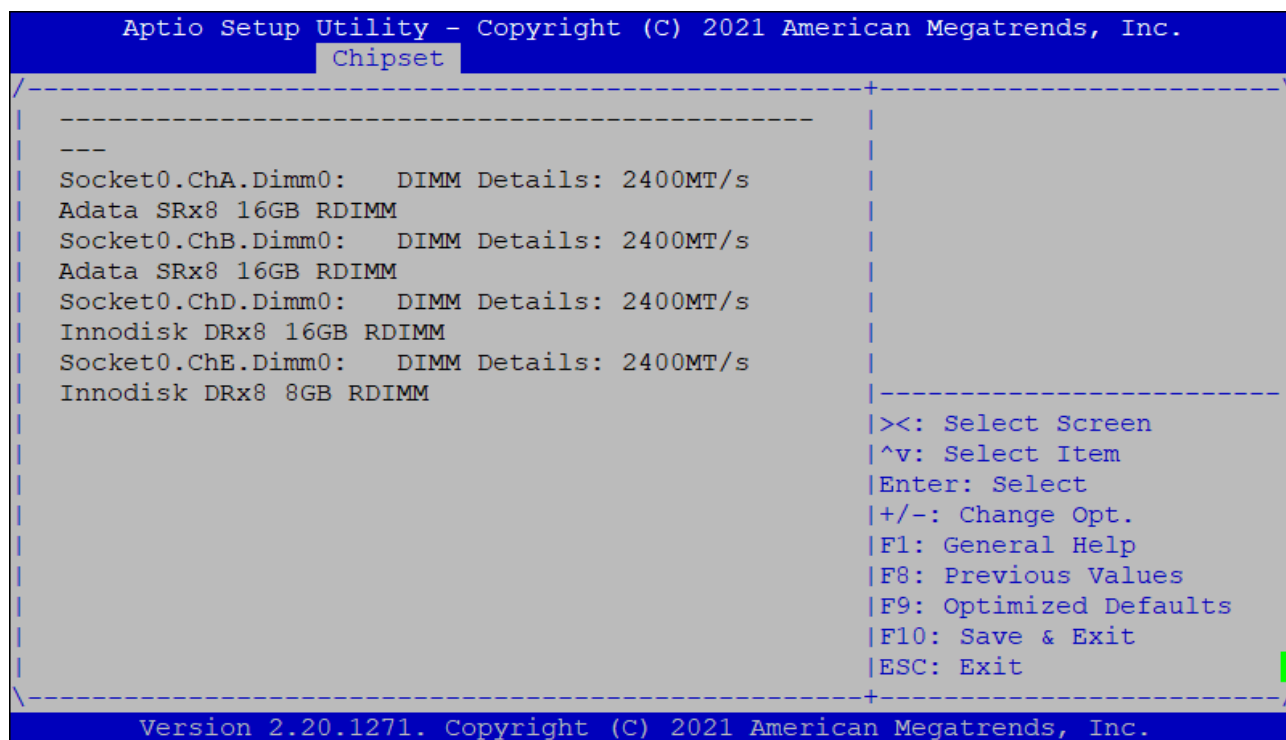
BIOS Item	Options	Description
CPU string	Info only	To show CPU info
Hyper-Threading [ALL]	Disable Enable	To enable or disable logical processor threads
Intel Virtualization Technology	Enable Disable	To enable or disable Intel Virtualization Technology

5.4.3 Sub-Menu: Memory Configuration



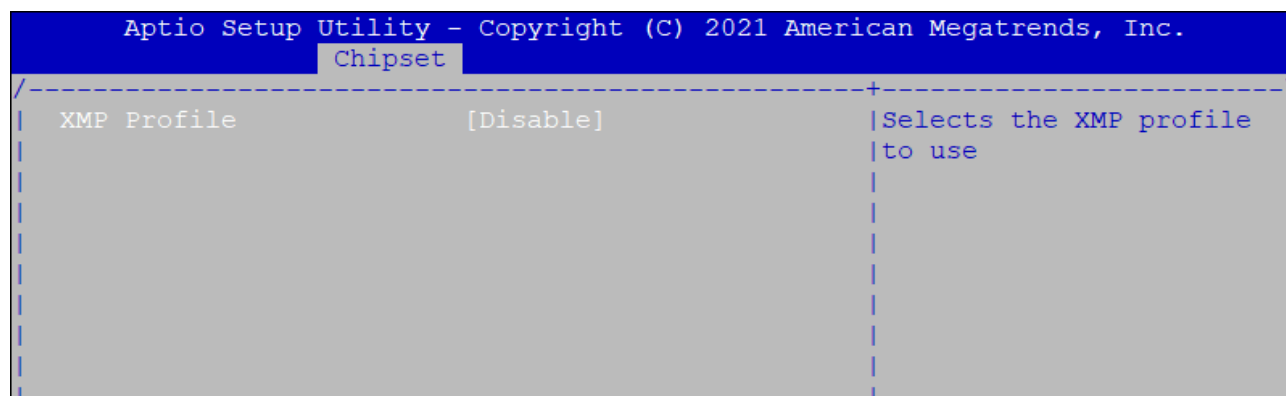
BIOS Item	Options	Description
Memory Frequency	Auto 800 1000 1066 1200	To select maximum memory frequency
Attempt Fast Boot	Auto Disable Enable	To enable or disable skip memory reference code on warm boots, Auto is Enable now
Attempt Fast Cold Boot	Auto Disable Enable	To enable or disable skip memory reference code on cold boots, Auto is Enable now

5.4.3.1. Sub-Menu: Memory Topology



BIOS Item	Options	Description
SocketX.ChX.DimmX	Info only	To show channel /dimm spd info

5.4.3.2. Sub-Menu: Memory Timings Override



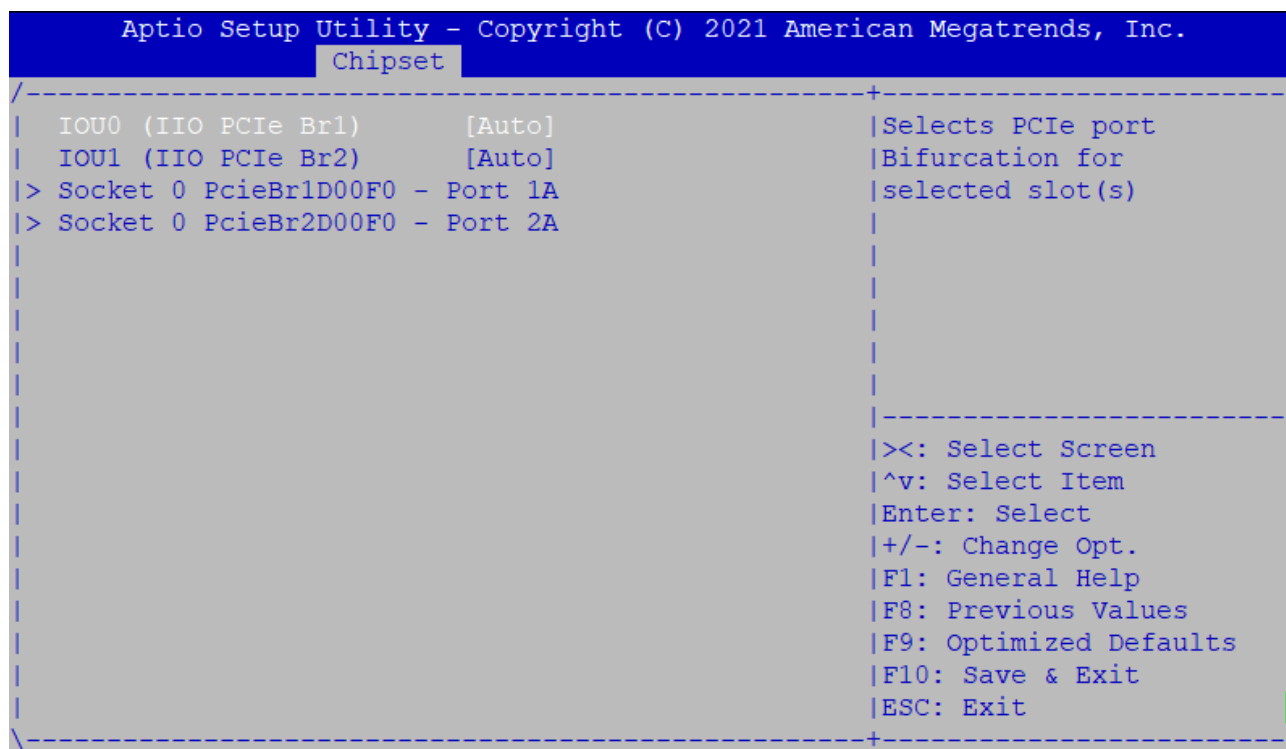
BIOS Item	Options	Description
XMP Profile	Disable Enable	To enable or disable Intel Extreme Memory Profiles to support memory over-clock

5.4.4 Sub-Menu: IIO Configuration

```
Aptio Setup Utility - Copyright (C) 2021 American Megatrends, Inc.
Chipset

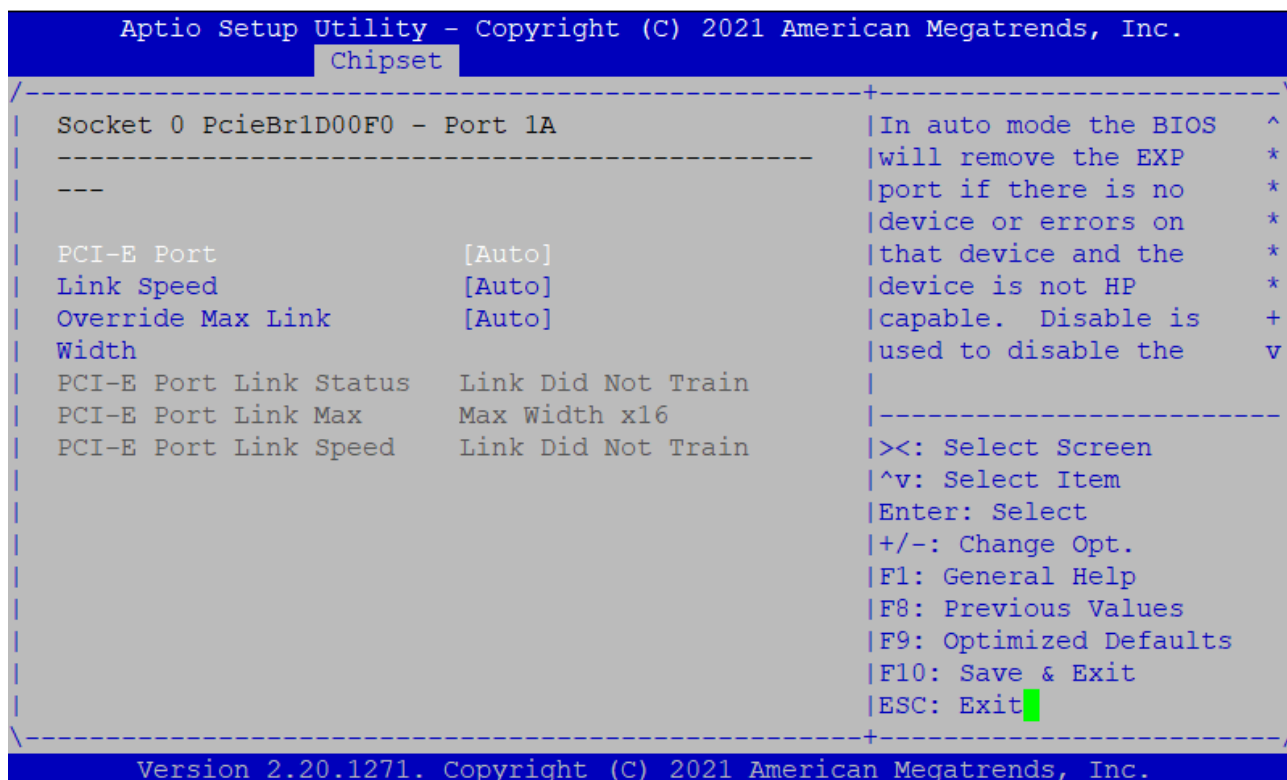
/-----+-----
| IIO Configuration                                |
|-----+-----|
| > Socket0 Configuration                         |
| > Intel. VT for Directed I/O (VT-d)             |
|                                                  |
|                                                  |
|                                                  |
|                                                  |
|                                                  |
|                                                  |
|                                                  |
|                                                  |
|                                                  |
|><: Select Screen                               |
|^v: Select Item                                 |
|Enter: Select                                  |
|+/-: Change Opt.                             |
|F1: General Help                             |
|F8: Previous Values                          |
|F9: Optimized Defaults                       |
|F10: Save & Exit                             |
|ESC: Exit                                    |
|-----+-----|
Version 2.20.1271. Copyright (C) 2021 American Megatrends, Inc.
```

5.4.4.1. Sub-Menu:Socket0 Configuration



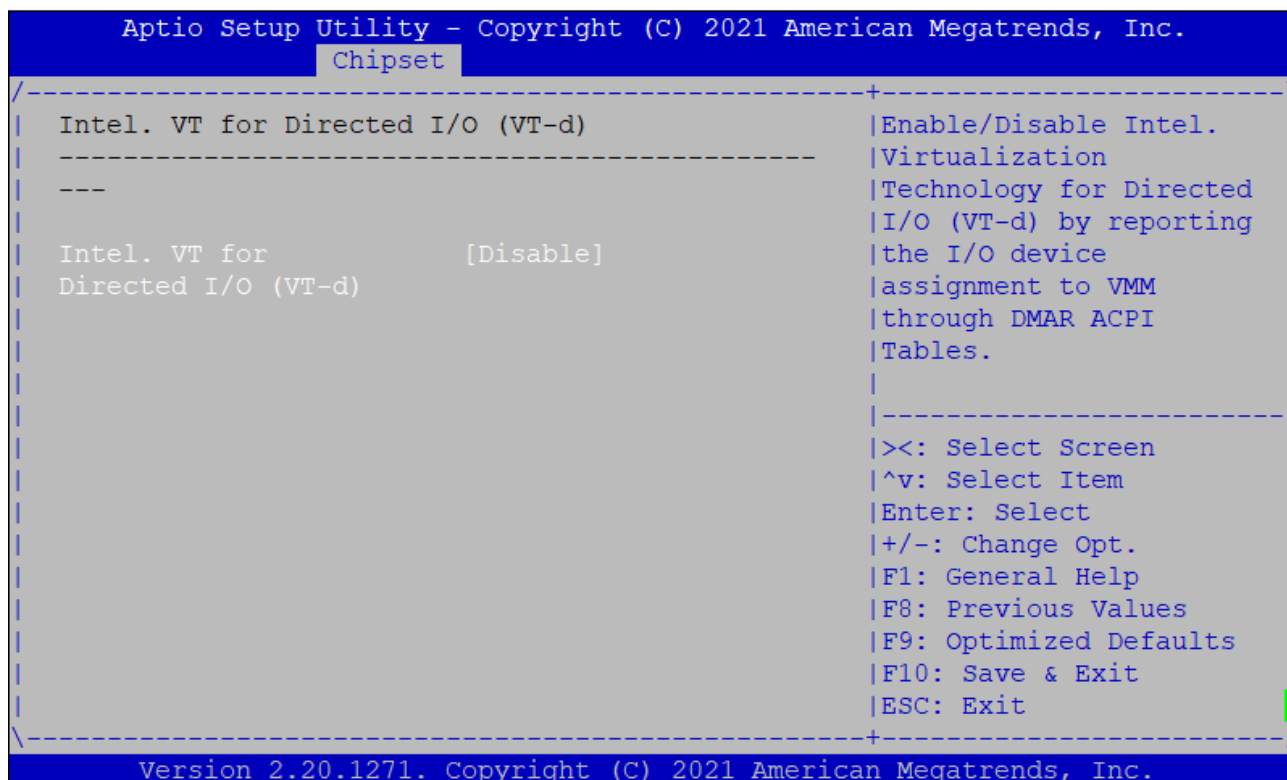
BIOS Item	Options	Description
IOU0 (IIO PCIe Br1)	X4x4x4x4 X4x4x8 X8x4x4 X8x8 X16 Auto	Selects PCIe port bifurcation for riser card upstream port , auto is x16
IOU0 (IIO PCIe Br2)	X4x4x4x4 X4x4x8 X8x4x4 X8x8 X16 Auto	Selects PCIe port bifurcation for riser card downstream port , auto is x16
Socket 0 PcieBr1D00F0	Sub Page	To show PCIe port link status
Socket 0 PcieBr2D00F0	Sub Page	To show PCIe port link status

5.4.4.2. Socket0 PcieBrxDxxx



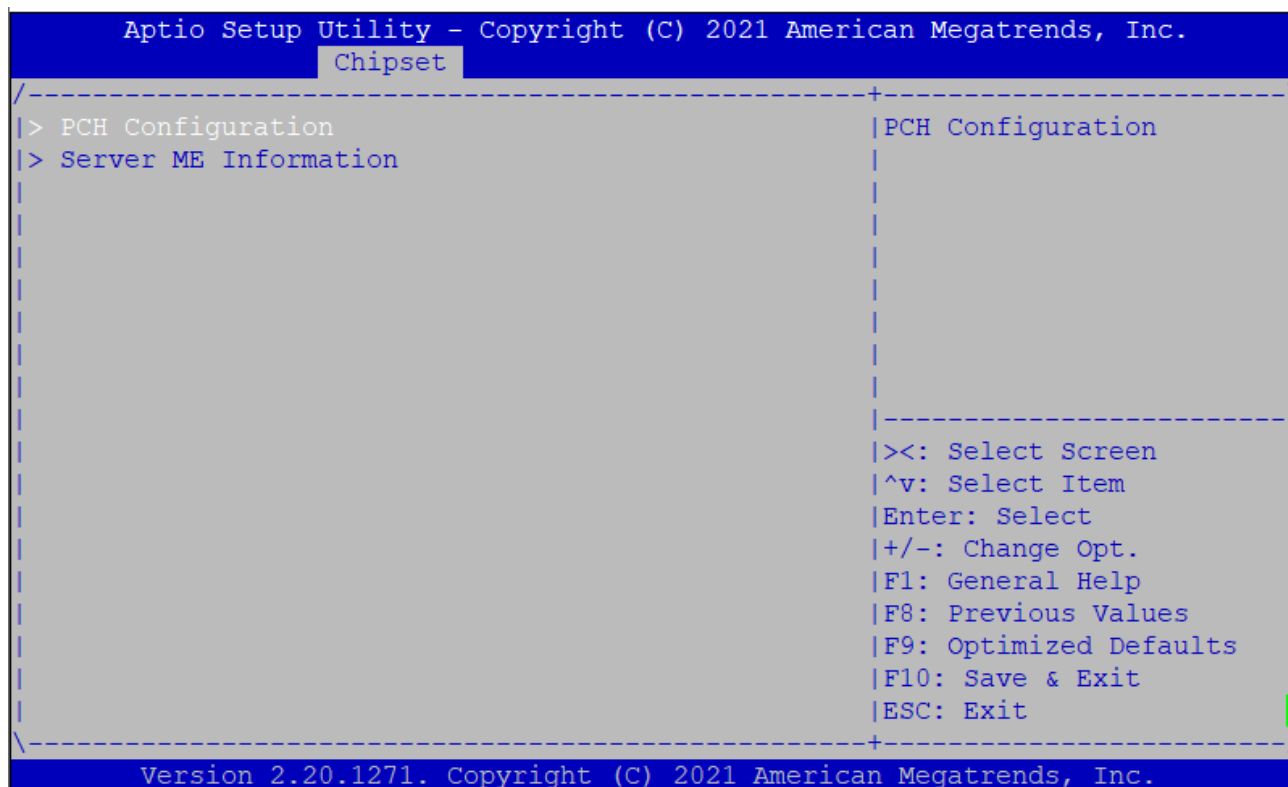
BIOS Item	Options	Description
PCI-E Port	Auto Disable Enable	To enable or disable PCI-E Port, Auto is enable
Link Speed	Auto Gen 1 (2.5 GT/s) Gen 2 (5 GT/s) Gen 3 (8 GT/s)	Choose Link Speed ,Auto is Gen3
Override Max Link Width	Auto X1 X2 X4 X8 X16	Override the max link width that was set by bifurcation
PCI-E Port Link Status PCI-E Port Link Max PCI-E Port Link Speed	Info Only	To show PCIE-E Port link or lot; width;speed

5.4.5 Sub-Menu: Intel(R) VT for Directed I/O (vt-d)

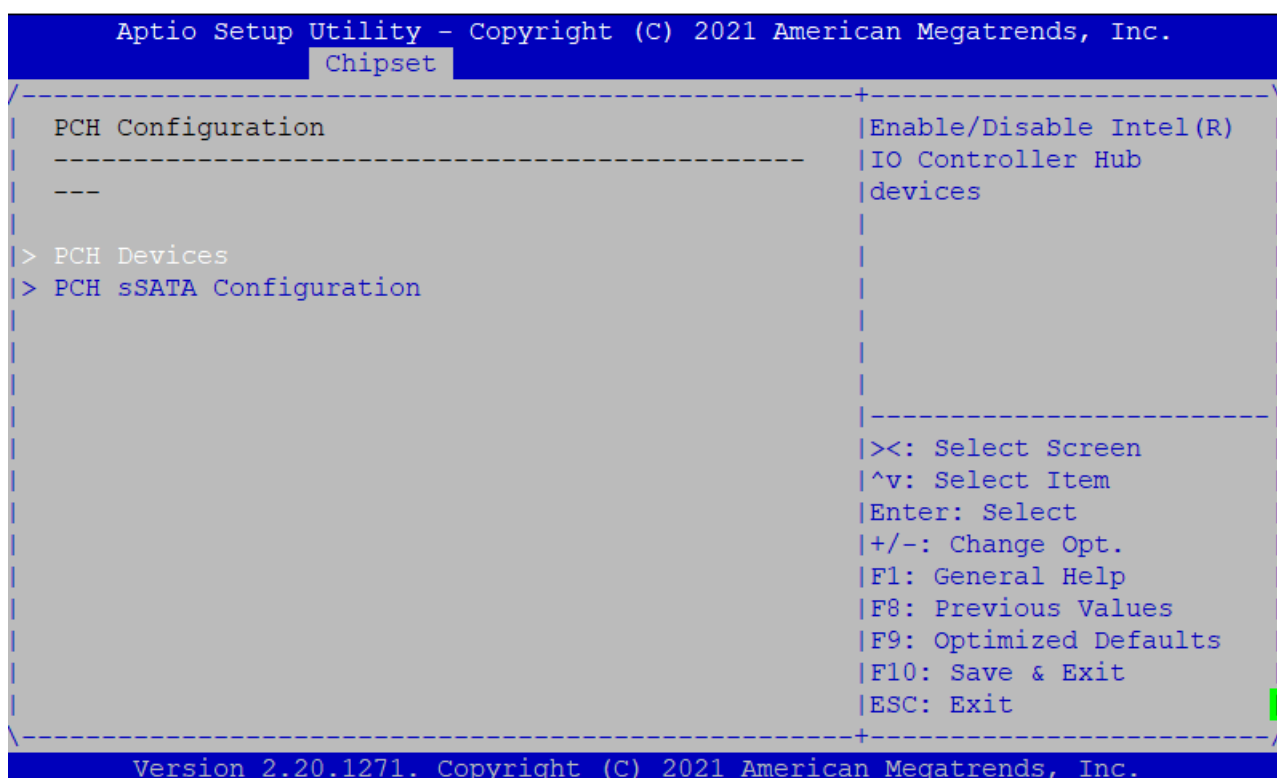


BIOS Item	Options	Description
Intel. VT for Directed I/O (VT-d)	Disable Enable	To enable or disable Intel Virtualization Technology for Directed I/O

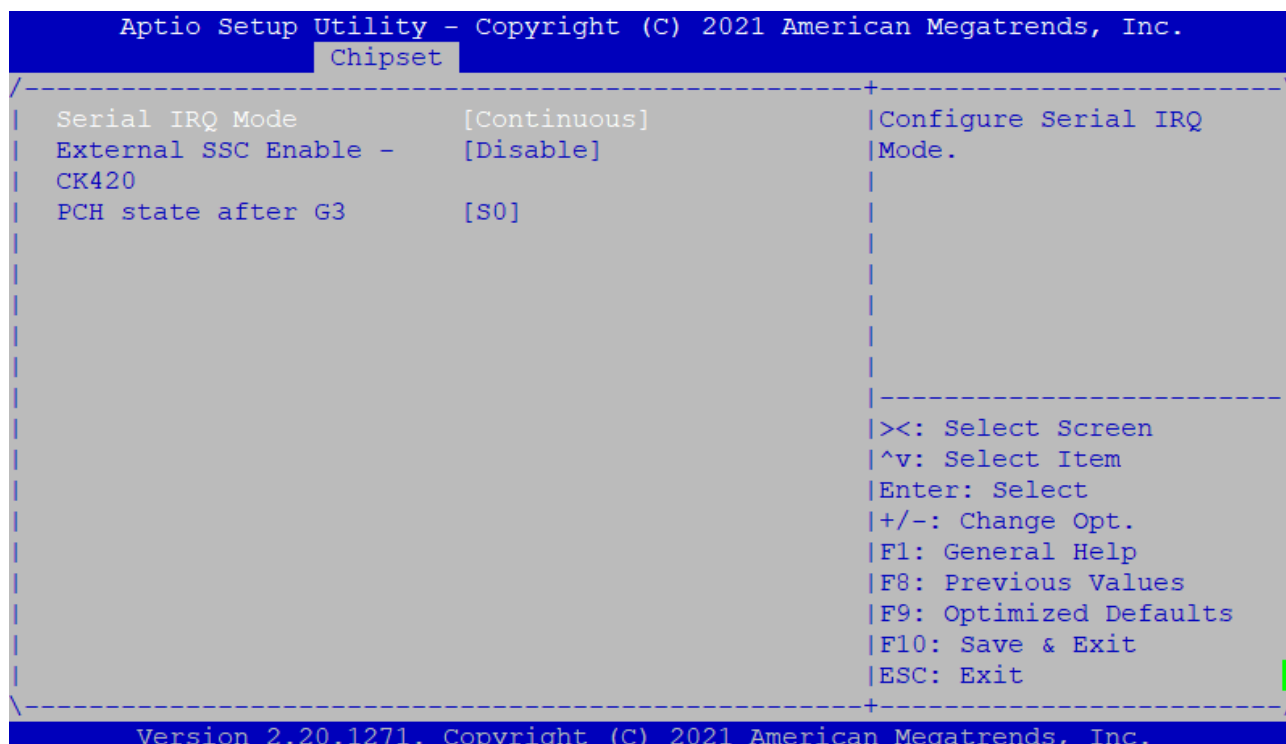
5.4.6 PCH-IO Configuration



5.4.7 Sub-Menu: PCH Configuration



5.4.7.1. Sub-Menu: PCH Devices



BIOS Item	Options	Description
Serial IRQ Mode	Quiet Continuous	Configure Serial IRQ Mode
Exrernal SSC Enable – CK420	Disable Enable	To enable or disable Spread Spectrum
PCH state after G3	S0 S5 Leave power state unchanged	Select S0/S5 power state after a G3

5.4.7.2. Sub-Menu: PCH sSATA Configuration

-----+-----		
sSATA Controller	[Enable]	^ Enable or Disable SATA
Configure sSATA as	[AHCI]	+ Port
SATA test mode	[Disable]	*
> SATA Mode options		*
Support Aggressive Link Power Management	[Enable]	*
		*
		+
sSATA Port 0	[Not Installed]	+
Port 0	[Enable]	+ -----
Hot Plug	[Disable]	+ ><: Select Screen
Configure as eSATA	[Disable]	+ ^v: Select Item
Spin Up Device	[Disable]	+ Enter: Select
sSATA Device Type	[Hard Disk Drive]	+ +/-: Change Opt.
SATA Topology	[Unknown]	+ F1: General Help
sSATA Port 1	[Not Installed]	+ F8: Previous Values
Port 1	[Enable]	+ F9: Optimized Defaults
Hot Plug	[Disable]	v F10: Save & Exit
		ESC: Exit
-----+-----		
Version 2.20.1271. Copyright (C) 2021 American Megatrends, Inc.		

BIOS Item	Options	Description
sSATA Controller	Enable Disable	For controlling sSATA controller's enabling/disabling.
Configure sSATA as	AHCI RAID	For sSATA operating mode setting.
SATA test mode	Enable Disable	To Enable/Disable SATA test mode
SATA Mode options	Sub Menu	SATA mode related options
Support Aggressive Link Power Management	Enable Disable	To Enable/Disable SALP
sSATA Port X	Info Only	To show installed sata info
Port X	Enable Disable	To enable or disable this sata port
Hot Plug	Enable Disable	To enable or disable this port as Hot Pluggabel
Configure as eSATA	Enable Disable	To enable or disable this port as eSATA
Spin Up Device	Enable Disable	To enable to disable spin up at boot
Ssata Device Type	Hard Disk Drive Solid State Drive	Identify the sata port is connected to SSD Drive or HDD Drive
SATA Topology	Unknown ISATA Direct Connect Flex M2	Setting the Ssata Topology

5.4.8 Sub-Menu: Server ME Information

```

Aptio Setup Utility - Copyright (C) 2021 American Megatrends, Inc.
  Chipset
-----+-----+-----+
General ME Configuration                ^|The altitude of the    ^|
Oper. Firmware Version 0E:4.0.4.97      *|platform location above *|
Backup Firmware          N/A            *|the see level,         *|
Version                  *|expressed in meters.   *|
Recovery Firmware        0E:4.0.4.77    *|The hex number is      *|
Version                  *|decoded as 2's          +|
ME Firmware Status #1    0x000F0245      *|complement signed     +|
ME Firmware Status #2    0x8811C026      *|integer.              v|
  Current State          Operational     *|
  Error Code             No Error        *|-----+-----+
  Recovery Cause         N/A             +|><: Select Screen      |
PTT Support              [Disable]       +|^v: Select Item        |
Suppress PTT Commands    [Disable]      +|Enter: Select         |
Altitude                 8000            +|+/-: Change Opt.      |
MCTP Bus Owner           0              +|F1: General Help      |
                                         +|F8: Previous Values   |
                                         +|F9: Optimized Defaults|
                                         v|F10: Save & Exit      |
                                         |ESC: Exit             |
-----+-----+-----+
Version 2.20.1271. Copyright (C) 2021 American Megatrends, Inc.

```

5.5 Security Menu

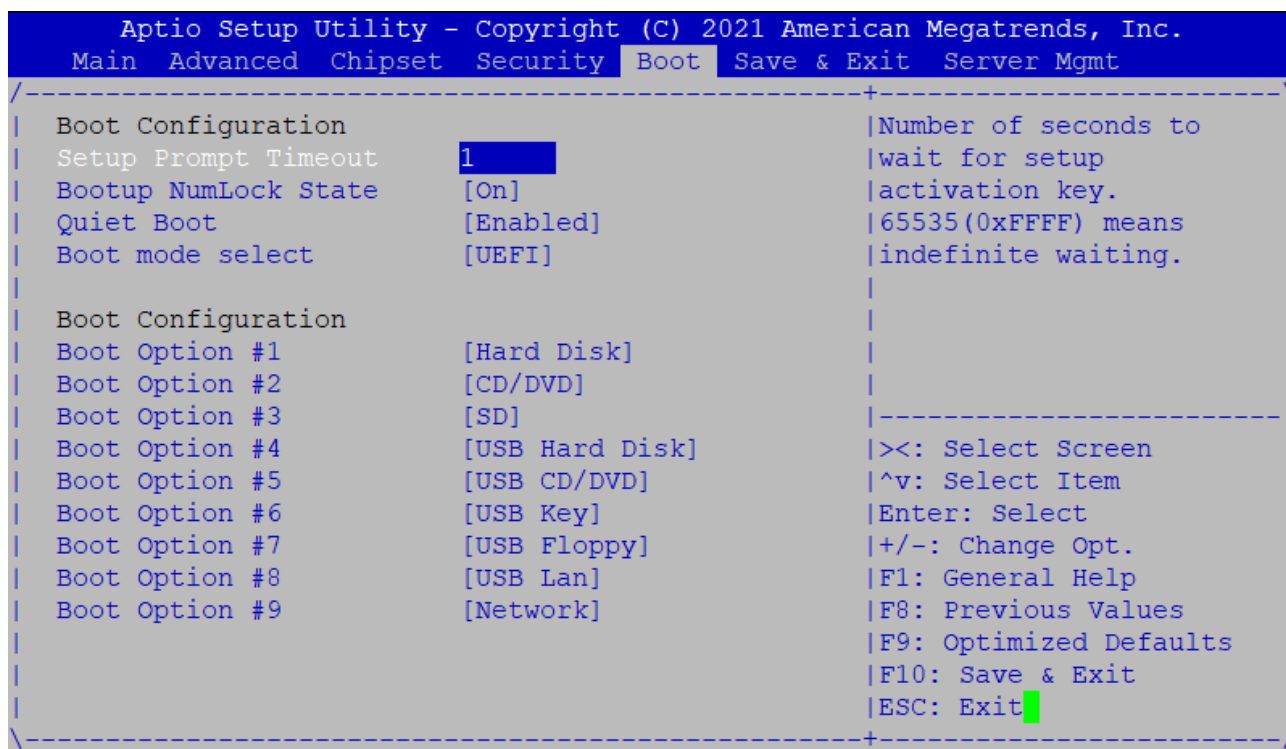
This menu contains the settings for system security.



BIOS Item	Options	Description
Administrator Password	Enter to set password	Configure/Clear Administrator Password. When pressing enter, a menu will be popped up for creating new password. When password installed, press enter without inputting password, it will clear password.
User Password	Enter to set password	Configure/Clear User Password. When pressing enter, a menu will be popped up for creating new password. When password installed, press enter without inputting password, it will clear password.

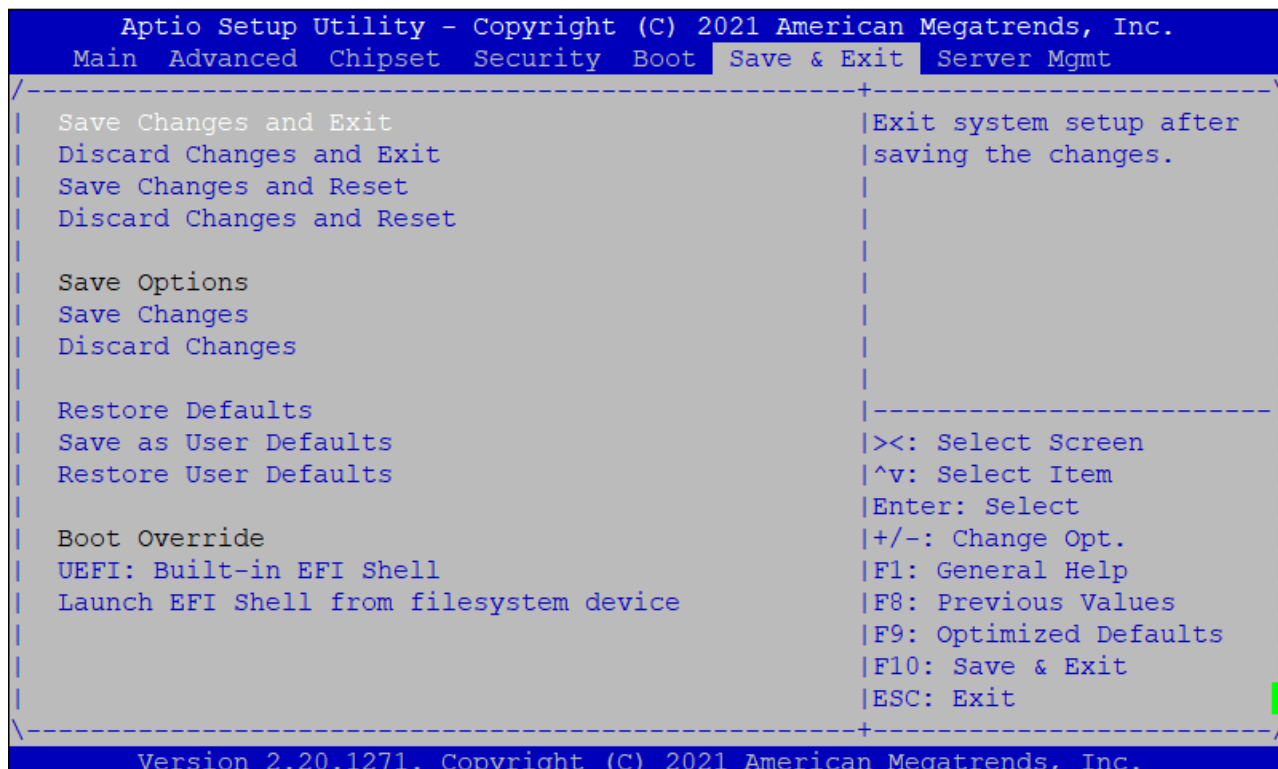
5.6 Boot Menu

This menu contains the settings for bootable devices in the system.



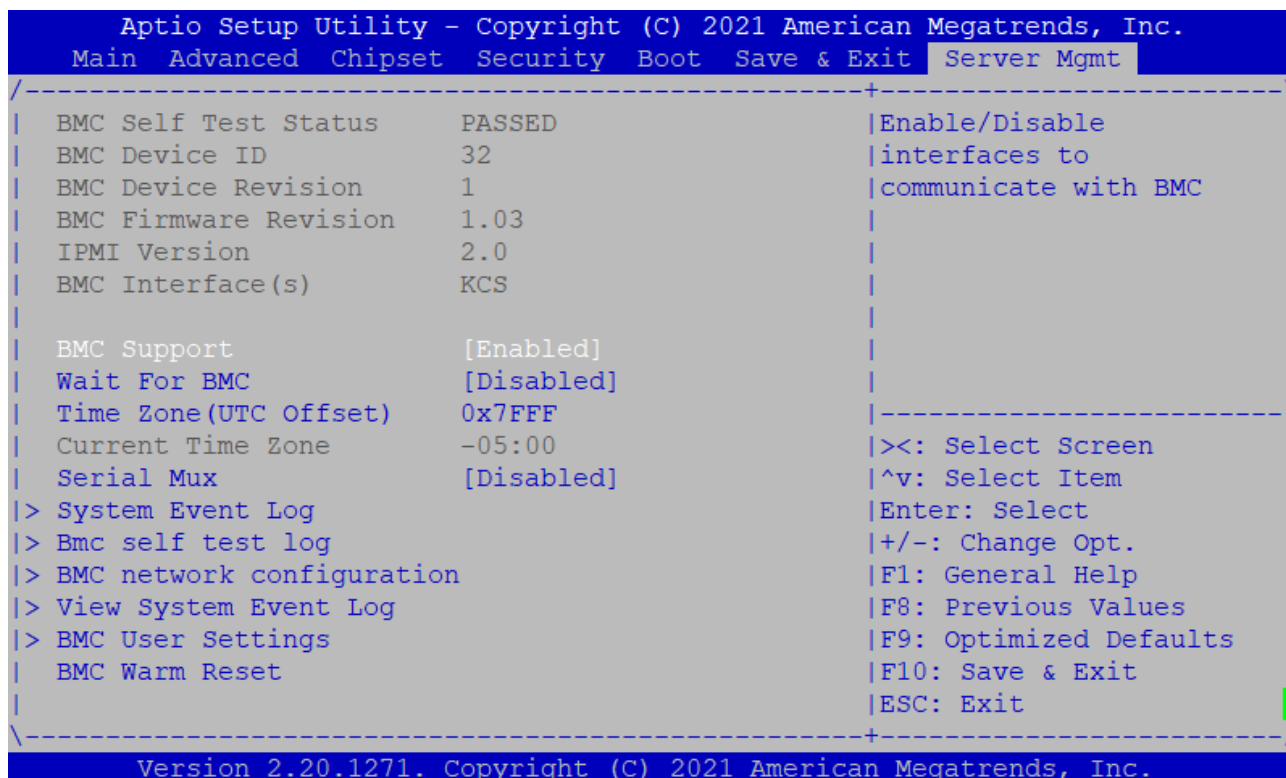
BIOS Item	Options	Description
Setup Prompt Timeout	1	Number of seconds to wait for setup activation
Bootup NumLock State	On Off	
Quiet Boot	Enabled Disabled	
Boot mode select	Legacy UEFI	Select boot mode, Legacy/UEFI.
Boot Option #1 ~ #9	#1: Hard Disk #2: CD/DVD #3: SD #4: USB Hard Disk #5: USB CD/DVD #6: USB Key #7: USB Floppy #8: USB LAN #9: Network	For boot priority setting.
XXXX Drive BBS Priorities	Sub-Menu	When the bootable device is attached to system and found by BIOS, it will be listed at boot option #. If there are many devices with the same device type found, it can set priority among these devices through this sub-menu.

5.7 Save & Exit Menu



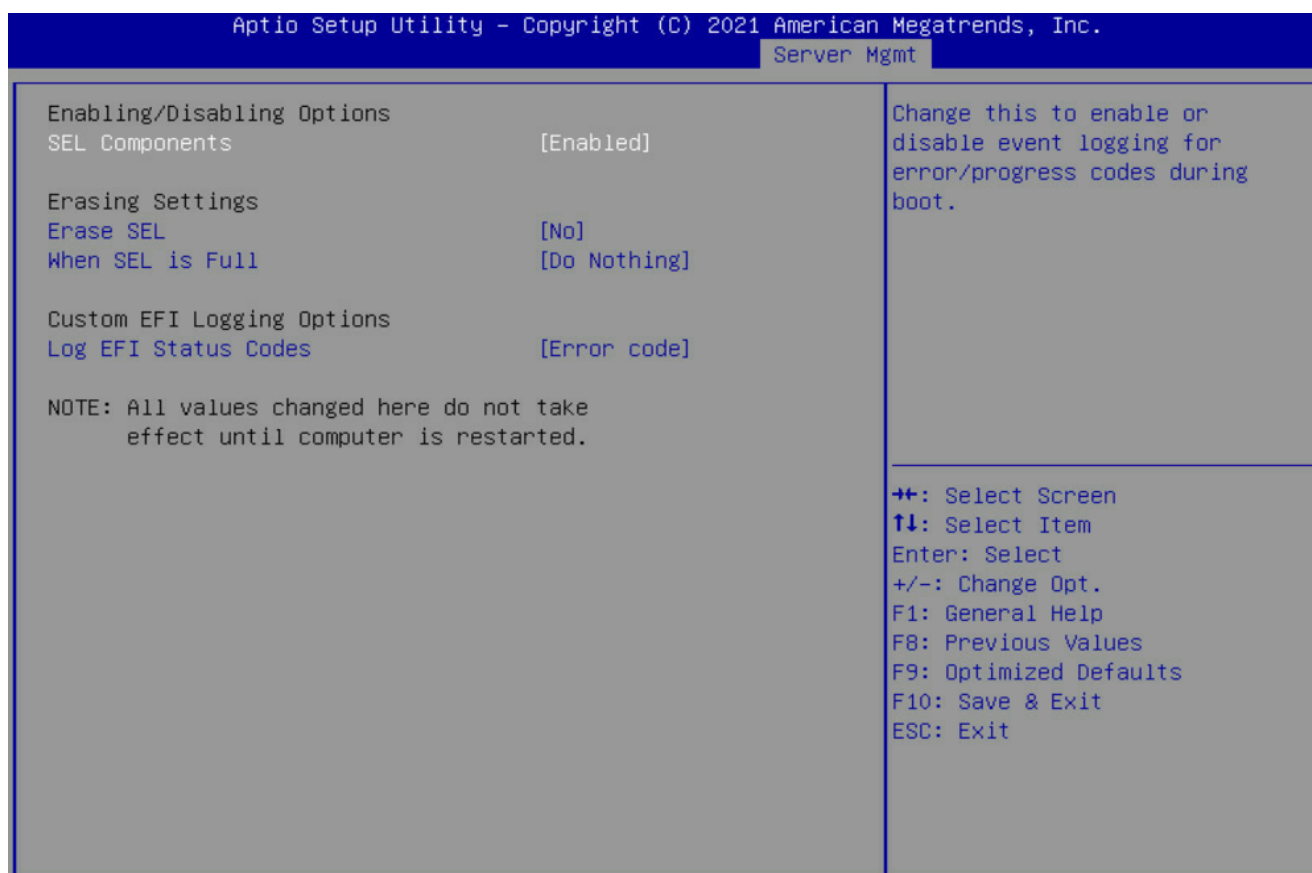
BIOS Item	Options	Description
Save Changes and Exit	Enter	Save changed settings and exit BIOS setup utility.
Discard Changes and Exit	Enter	Skip changed setting and exit BIOS setup utility.
Save Changes and Reset	Enter	Save all changed settings and let system do reset to boot system.
Discard Changes and Reset	Enter	Discard all changed settings and let system do reset to boot system.
Save Changes	Enter	Save all changed settings.
Discard Changes	Enter	Discard changes done so far to any of the setup options.
Restore Default	Enter	Load the default made when BIOS was built.
Save as User Default	Enter	Save all changed done so far as User Defaults.
Restore User Default	Enter	Load the default that user save as user defaults.
Boot Override	Info-only	

5.8 Server Mgmt Menu



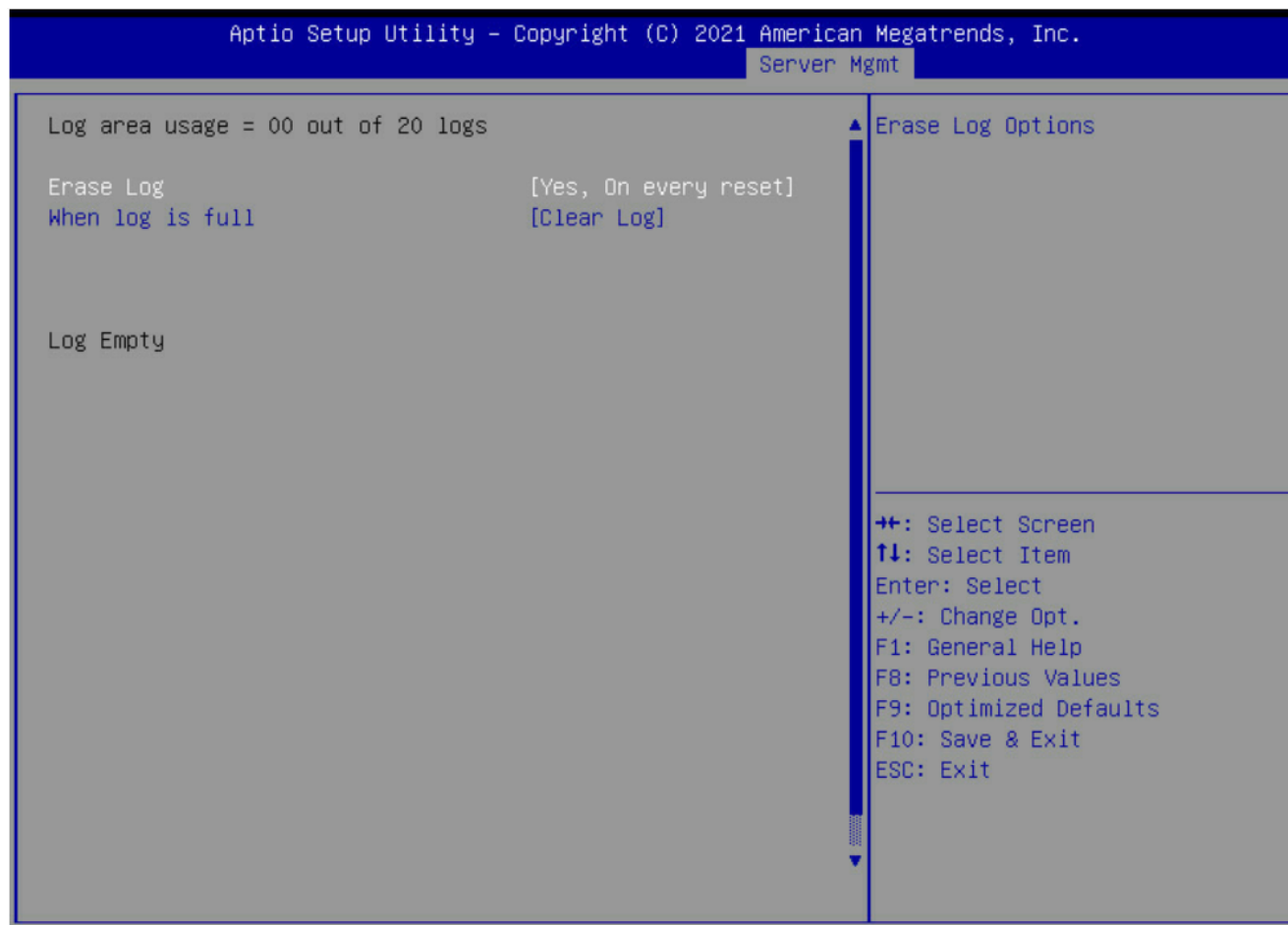
BIOS Item	Options	Description
BMC Self Test Status	Info-only	To show BMC self test status
BMC Device ID	Info-only	To show BMC Device ID
BMC Device Revision	Info-only	To show BMC Device Revision
BMC Firmware Revision	Info-only	To show BMC Firmware version
IPMI Version	Info-only	To show IPMI version
BMC Interfaces(s)	Info-only	To show BMC interface such as KCS
BMC support	Enabled Disabled	To enable or disable communicate with BMC
Wait For BMC	Enabled Disabled	To enable or disable wait for BMC 30s before sending Self Test command
Time Zone(UTC Offset)	0x7FFF	Enter UTC Offset in hours, 0x7FFF to consider BIOS time as local time
Current Time Zone	Info-only	
Serial Mux	Enabled Disabled	To enable or disable serial mux configuration
System Event Log	Sub-Menu	To change SEL configuration
BMC self test Log	Sub-Menu	Logs the report returned by bmc self test command
BMC network configuration	Sub-Menu	Configure BMC network parameters
View System Event log	Enter	Press Enter to View SEL records,
BMC User Settings	Sub-Menu	To add/delete user and set user privilege limit
BMC Warm Reset	Enter	Press Enter to do warm Reset BMC

5.8.1 Sub-Menu: System Event Log



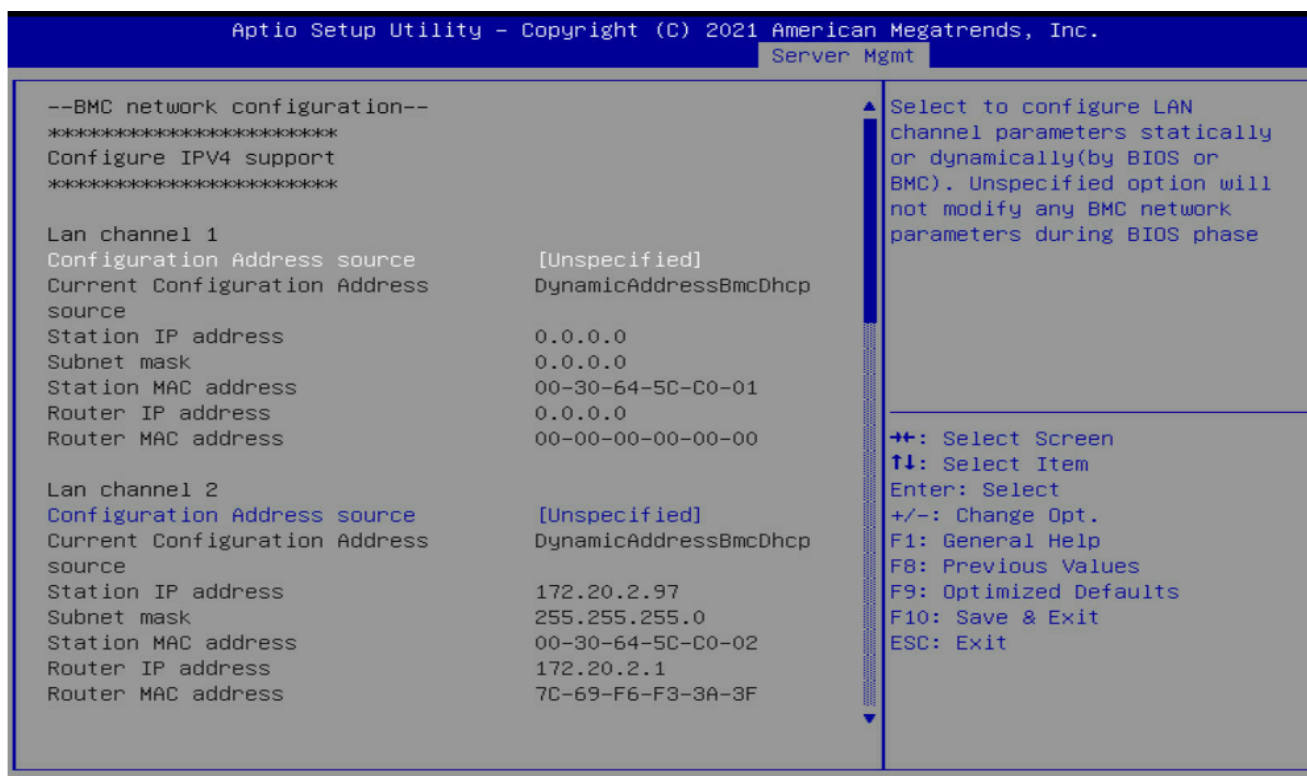
BIOS Item	Options	Description
SEL Components	Enabled Disabled	To enable or disable event logging for error codes during boot
Erase SEL	No Yes, on next reset Yes, on every reset	Choose options for erasing SEL
When SEL is Full	Do Nothing Erase immediately	Choose options for reactions when SEL is full
Log EFI Status Codes	Disabled Both Error code Progress code	Log Status code type. Error code or progress code or both or disabled
All values changed here do not take effect until computer is restarted	Read only	Note should take computer restart when changing items above

5.8.2 Sub-Menu: BMC Self-test Log



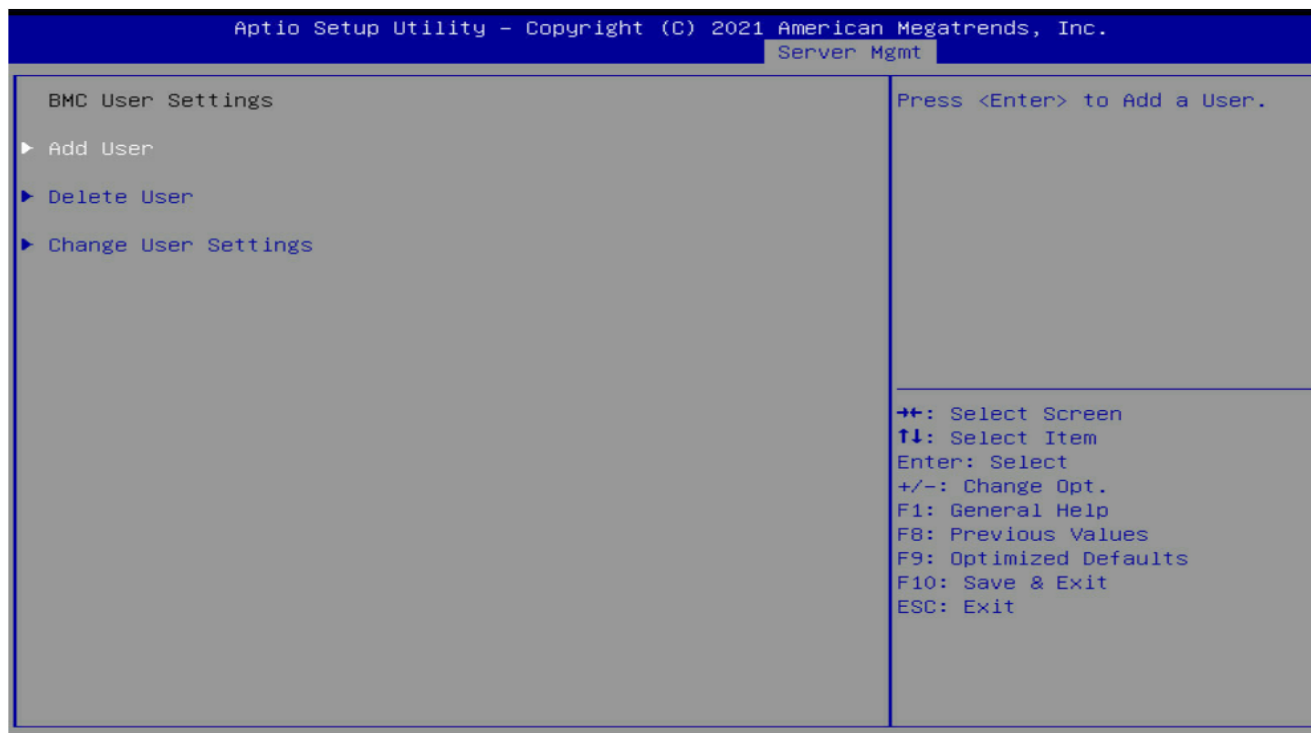
BIOS Item	Options	Description
Log area usage = 00 out of 20 logs	Read only	Log area usage numbers
Erase Log	No Yes, on every reset	Erase Log Options
When log is Full	Clear Log Do not log any more	Select the action to be taken when log is full

5.8.3 Sub-Menu: BMC Network Configuration



BIOS Item	Options	Description
Configure IPV4 support	Read only	
Configuration Address source	Unspecified Static DynamicBmcDhcp DynamicBmcNonDhcp	Select to configure LAN channel parameters statically or dynamically(by BIOS or BMC). Unspecified option will not modify any BMC network parameters during BIOS phase
Configure IPV6 support	Read only	
IPV6 Support	Disable Enable	Enable or Disable LAN IPV6 Support
Configuration Address source	Unspecified Static DynamicBmcDhcp	To configure LAN Address source when IPV6 supported

5.8.4 Sub-Menu: BMC User Settings



BIOS Item	Options	Description
Add User	Sub Menu	Press <Enter> to Add a User
Delete User	Sub Menu	Press <Enter> to Delete a User
Change User Settings	Sub Menu	Press <Enter> to Change User Settings

5.8.4.1. Sub-Menu: Add User

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Server Mgmt

BMC Add User Details

User Name

User Password

User Access [Disable]

Channel No 0

User Privilege Limit [Reserved]

Enter BMC User Name

→+: Select Screen
 ↑↓: Select Item
 Enter: Select
 +/-: Change Opt.
 F1: General Help
 F8: Previous Values
 F9: Optimized Defaults
 F10: Save & Exit
 ESC: Exit

BIOS Item	Options	Description
User Name	Enter to set user name	Enter BMC User Name
User Password	Enter to set password	Enter BMC User Password
User Access	Disable Enable	Enable/Disable the BMC User's Access
Channel No	0~15	Enter BMC Channel Number
User Privilege Limit	Reserved Callback User Operator Administrator OEM Proprietary No Access	Enter BMC User Privilege Limit for Selected Channel

5.8.4.2. Sub-Menu: Delete User

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 Server Mgmt

BMC Delete User Details

User Name

User Password

Enter BMC User Name

→←: Select Screen
 ↑↓: Select Item
 Enter: Select
 +/-: Change Opt.
 F1: General Help
 F8: Previous Values
 F9: Optimized Defaults
 F10: Save & Exit
 ESC: Exit

BIOS Item	Options	Description
User Name	Enter to set user name	Enter BMC User Name
User Password	Enter to set password	Enter BMC User Password

5.8.4.3. Sub-Menu: Change User Setting

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Server Mgmt

BMC Change User Settings User Name User Password Change User Password User Access [Disable] Channel No 0 User Privilege Limit [Reserved]	Enter BMC User Name +/: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F8: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
---	---

BIOS Item	Options	Description
User Name	Enter to set user name	Enter BMC User Name
User Password	Enter to set password	Enter BMC User Password
User Access	Disable Enable	Enable/Disable the BMC User's Access
Channel No	0~15	Enter BMC Channel Number
User Privilege Limit	Reserved Callback User Operator Administrator OEM Proprietary No Access	Enter BMC User Privilege Limit for Selected Channel

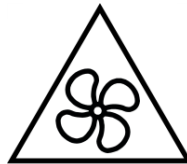
Important Safety Instructions

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 55°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.



Hazardous moving parts. Keep body parts out of the motion path.



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.
 - The power cord must be connected to a socket or outlet with a ground connection.
7. Never attempt to fix the equipment. Equipment should only be serviced by qualified personnel.
8. An RTC battery may be provided for uninterrupted, backup or emergency power.



Risk of explosion if battery is replaced with one of an incorrect type.
Discard used batteries according to the manufacturer's instructions.

9. This equipment is not suitable for use in locations where children are likely to be present.
10. 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.
11. Please pay strict attention to all warnings and advisories appearing on the device, to avoid injury or damage.
12. The equipment may have more than one power supply input. To reduce the risk of electrical shock, trained personnel should disconnect all power supply inputs before servicing.



Shock hazard! Disconnect all power supply inputs before servicing.



Shock hazard!
Risque d'électrocution!



Multiple power sources
Sources d'alimentation multiples

13. It is recommended that equipment be installed only in a server room or computer room where access is:
 - Restricted to qualified service personnel or users familiar with restrictions applied to the location, reasons therefor, and any precautions required;
 - Only afforded by the use of a tool or lock and key, or other means of security, and is controlled by the authority responsible for the location.
14. Suitable for installation in Information Technology Rooms in accordance with Article 645 of the National Electrical Code and NFPA 75.
15. This product is intended to be supplied by a certified DC power source with output rating: -36 to -72VDC, 17-9A minimum. The DC power rating current is 17-9A. All power connection wiring must be performed by a qualified electrician in accordance with National Electrical Code, ANSI/NFPA 70 and Canadian Electrical Code, Part I, CSA C22.1. The DC power supply should be well-grounded to ensure safe operation. The protective earthing conductor shall be minimum 12 AWG and having green-and-yellow insulation. The ground wire should be installed first (before "+" and "-") and then removed.

Consignes de Sécurité Importantes

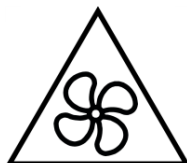
Pour assurer la sécurité de l'utilisateur, veuillez lire et suivre toutes les **directives**, ainsi que les **AVERTISSEMENTS**, **MISES EN GARDE** et **REMARQUES** de ce manuel et indiqués sur l'équipement associé avant de manipuler ou utiliser l'équipement.

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 55 °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.

**WARNING:**

AVERTISSEMENT

Pièces mobiles dangereuses. Gardez les parties du corps hors de la trajectoire.



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.
 - Le cordon d'alimentation doit être connecté à une prise ou à une prise de courant avec mise à la terre.
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.



mise en garde

Risque d'explosion si la batterie est remplacée par une batterie d'un type incorrect. Jetez les piles usagées conformément aux instructions du fabricant.

9. Cet équipement ne convient pas à une utilisation dans des lieux pouvant accueillir des enfants.
10. 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.
11. 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.
12. L'équipement peut avoir plus d'une entrée d'alimentation. Pour réduire le risque d'électrocution, le personnel qualifié devrait déconnecter toutes les entrées d'alimentation avant de procéder à l'entretien.



mise en garde

Risque d'électrocution! Débranchez toutes les entrées d'alimentation avant de procéder à l'entretien.



Shock hazard!

Risque d'électrocution!



Multiple power sources

Sources d'alimentation multiples

13. Il est recommandé que l'équipement soit installé que dans une salle de serveur ou de la salle informatique où:
- L'accès est limité au personnel de maintenance qualifié ou utilisateurs familiers avec les restrictions appliquées à l'emplacement, motifs, et tout les précautions nécessaires, et;
 - L'accès est uniquement assurée par l'utilisation d'un outil ou clé, ou d'autres moyens de sécurité, et est contrôlé par l'autorité responsable de l'emplacement.
14. Peut être installé dans des salles de matériel de traitement de l'information conformément à l'article 645 du National Electrical Code et à la NFPA 75.
15. Ce produit est destiné à être alimenté par une source d'alimentation CC certifiée avec une puissance de sortie: -36 à -72VDC, 17-9A minimum. Le courant de puissance CC est de 17-9A. Tout le câblage de connexion d'alimentation doit être effectué par un électricien qualifié conformément au Code national de l'électricité, ANSI / NFPA 70 et au Code canadien de l'électricité, Partie I, CSA C22.1. L'alimentation CC doit être bien mise à la terre pour garantir un fonctionnement sûr. Le conducteur de mise à la terre de protection doit être au minimum 12 AWG et avoir une isolation verte et jaune. Le fil de terre doit être installé en premier (avant «+» et «-») puis retiré.

Getting Service

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