ROC236A

19" 1U Rack-mount Intel® Ivy Bridge Fanless Rugged System with Core i7 processors, 9V to 36V DC-in, Extended Temperature. -40 to 70°C

Safety information

Electrical safety

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

Operation safety

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

Statement

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- All trademarks are the properties of the respective owners.
- All product specifications are subject to change without prior notice

Revision History

Revision	Date (yyyy/mm/dd)	Changes
V1.0	2014/11/18	Initial release
V1.1	2019/11/11	Modify Front I/O

Packing list

☐ 19" 1U Rack-mount Intel® HM76 Fanless Rugged System

☐ Accessories:

Item	P/N	Description	Q'ty
1	0P0600000002100L	Driver CD	1
2	0F0132500600000L	Screw Flat Plating Ni White M4 L:6mm	10
3	0N0600000000010L	BRACKET EAR-S 90x43.4x21.3mm	2
4	0F0100500600100L	Screw cross circle Plating Ni white w/two washer M3x6 M3 L:6mm	4

If any of the above items is damaged or missing, please contact your local distributor.

Table of Contents

Chapter 1: Product Introduction

1.1 Key Features

System	
CPU Type	Intel® Ivy Bridge 22nm BGA Type Core™ i7/i5/i3 Core™ i7-3517UE (2C x 1.7 GHz), 4M L2 cache (17W) Core™ i5-3610ME (2C x 2.7 GHz), 3M L2 cache (35W) Core™ i3-3217UE (2C x 1.66 GHz), 3M L2 cache (17W)
Chipset	Intel® HM76
Memory Type	1 x 204-pin SO-DIMM DDR3 1333/1600 MHz up to 8GB
Expansion Slot	1 x Mini PCIe
Storage Device	1 x 2.5" SATA HDD/SSD
Front I/O	
Power Button	Yes
Power LED	Yes
HDD LED	Yes
USB	2 x USB 2.0
Reset Button	Yes
Rear I/O	
DVI-I	1 (for DVI-D & VGA)
VGA	1
Ethernet	2 x RJ45
COM	1x RS232
USB	2 x USB 3.0, 4 x USB 2.0
DC-in	1 x DC Power Jack 2.5mm
Mechanical & Environment	
Power Requirements	9V to 36V DC-in
Dimension (W x H x D)	440 x 44.6 x 287.2 mm (17.32" x 1.73" x 11.30")
Operating Temp.	-20 to 70°C (ambient with air flow)
Storage Temp.	-20 to 80°C
Relative Humidity	10% to 90%, non-condensing
Certification	CE compliant

Specifications are subject to change without notice

1.2 Front Panel Components
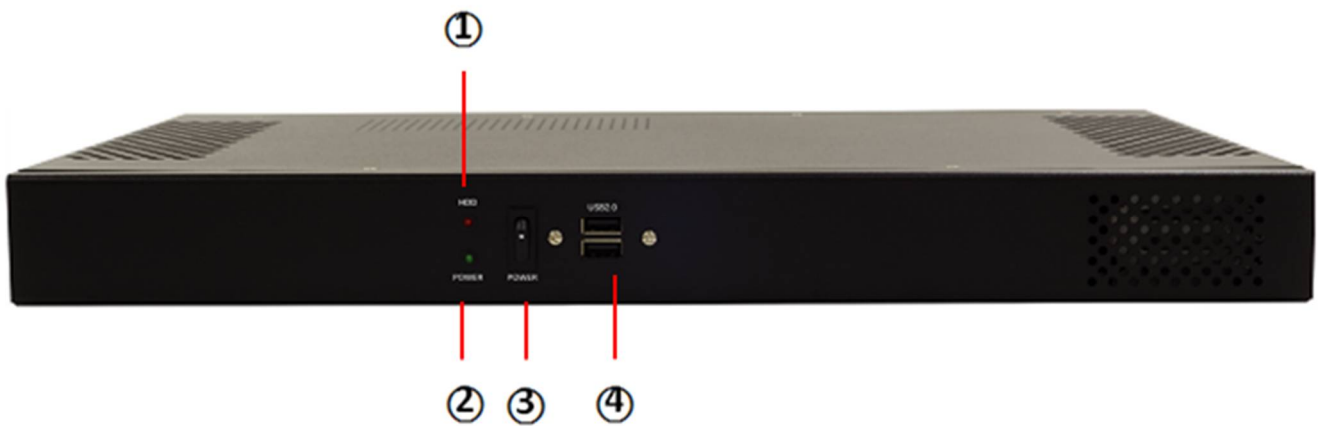
1	HDD LED
2	Power LED
3	Power Button
4	2 x USB 2.0

1.3 Rear Panel Components
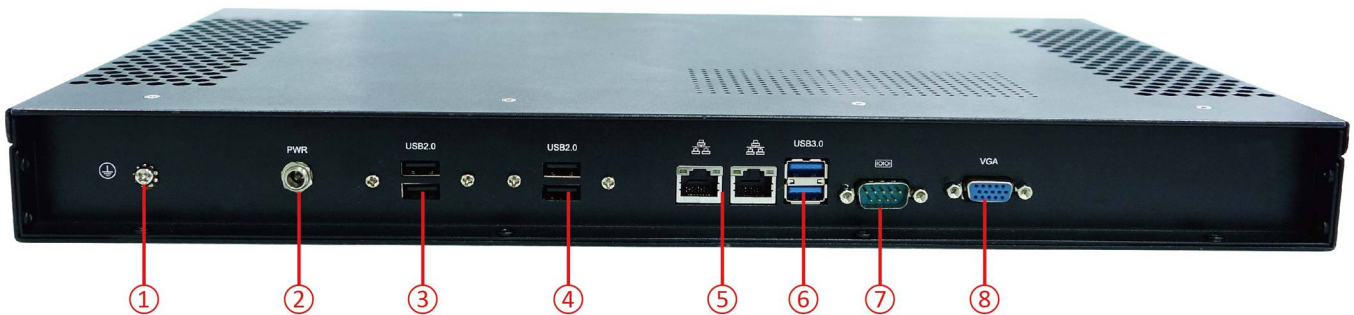
1	GND
2	Power Input 9V to 24V DC-in
3	2 x USB 2.0
4	2 x USB 2.0
5	LAN port, 2 x RJ45
6	2 x USB 3.0
7	COM port, RS232
8	VGA port

1.4 Mechanical Dimensions

44.6

440

286

446

462.6

468.6

482.6
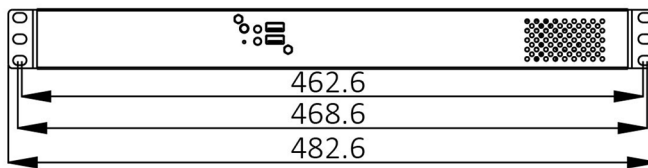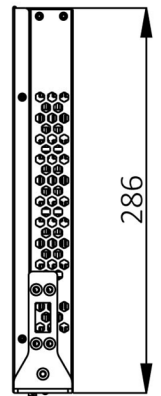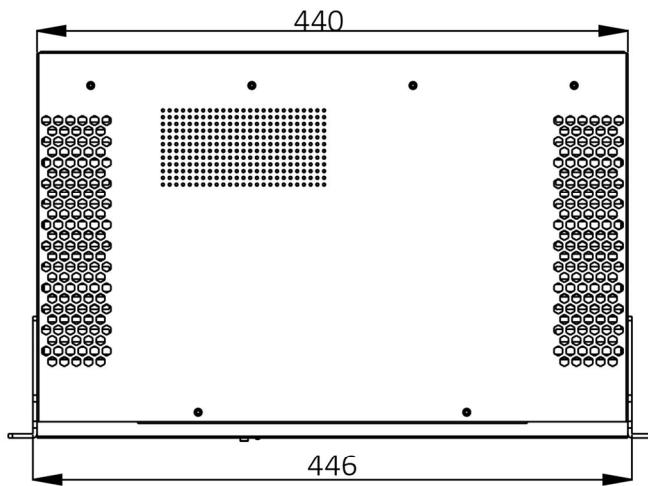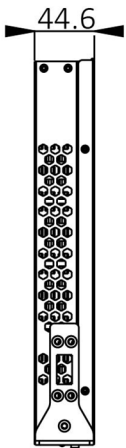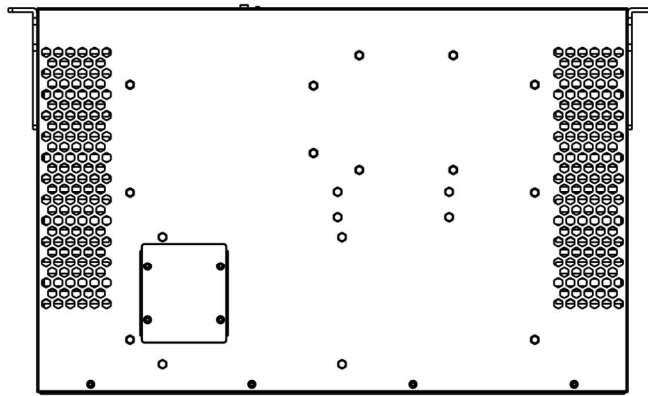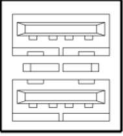
Chapter 2: Jumpers and Connectors

2.1 Front Panel Connector Pin Definitions

2 x USB 2.0

Pin	Definition	Pin	Definition
1	+5V	5	+5V
2	USBD-	6	USBD-
3	USBD+	7	USBD+
4	GND	8	GND

Status Indicators
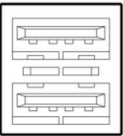
Status	LED Color
PWR	RED
HDD	GREEN

2.2 Rear Panel Connector Pin Definitions
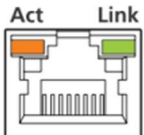
USB Port: USB2.0

Pin	Definition	Pin	Definition
1	+5V	5	+5V
2	USBD-	6	USBD-
3	USBD+	7	USBD+
4	GND	8	GND
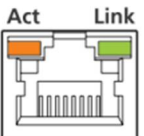
LAN port, 2 x RJ45

Pin	Definition
R1	LAN_MDI0P
R2	LAN_MDI0N
R3	LAN_MDI1P
R4	LAN_MDI1N
R7	LAN_MDI2P
R8	LAN_MDI2N
R9	LAN_MDI3P
R10	LAN_MDI3N

SPEED LED	ACTIVE LED
Green: 1000Mbps	Orange (blinking): activity
Orange: 100Mbps	No Light: not link
No Light: 10Mbps	Orange (no blinking): link

2 x USB 3.0

Upper USB		Lower USB	
Pin	Definition	Pin	Definition
1	+5VDUAL	1	+5VDUAL
2	D-	2	D-
3	D+	3	D+
4	GND	4	GND
5	StdA_SSTX-	5	StdA_SSTX-
6	StdA_SSTX+	6	StdA_SSTX+
7	GND_DRIAN	7	GND_DRIAN
8	StdA_SSRX-	8	StdA_SSRX-
9	StdA_SSRX-	9	StdA_SSRX-

COM port, RS232

Pin	Definition
1	DCD#
2	RXD
3	TXD
4	DTR#
5	GND
6	DSR#
7	RTS#
8	CTS#
9	RI#

VGA port

Pin	Definition	Pin	Definition
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 LOCK
8	GND		

2.3 Internal Connectors

Mini PCIe connector

Pin	Definition	Pin	Definition
1	WAKE#	2	3.3V
3	NC	4	GND
5	NC	6	+1.5V
7	CLKREQ#	8	UIM_PWR
9	GND	10	UIM_DATA
11	PCIE_MINI1_100M_N	12	UIM_CLK
13	PCIE_MINI1_100M_P	14	UIM_RESET
15	GND	16	UIM_VPP
17	NC	18	GND
19	NC	20	CARD_EN
21	GND	22	MINI_RST#
23	RXN	24	+3.3VAUX
25	RXP	26	GND
27	GND	28	+1.5V
29	GND	30	SCLK0
31	TXN	32	SDATA0
33	TXP	34	GND
35	GND	36	USB_D-
37	GND	38	USB_D+
39	3.3V	40	GND
41	3.3V	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	+1.5V
49	NC	50	GND
51	NC	52	+3.3V

SATA connector

Pin	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

Chapter 3: Installation

This chapter provides more detailed information and let you know how to install components into the ROC236A 1U Rack-mount Fanless Rugged System

3.1 Remove the top case

⚠️ Prior to removing the chassis cover, make sure the unit's power is off and disconnected from the power sources to prevent electric shock or system damage.

⚠️ Please verify all screws (or bolts) have been properly fastened to avoid damages which may be caused by loosened parts.

1. Remove the mounting screws and put them in a safe place for later use. Take the top case off by slide it.
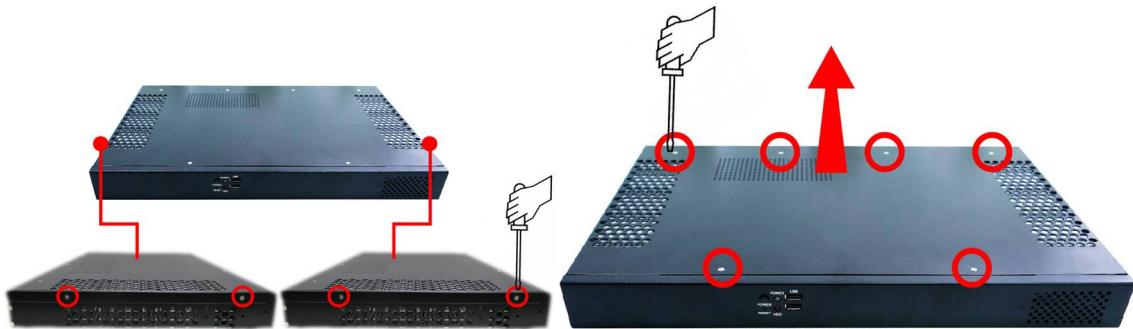
3.2 Replace the top case

1. Slide the top case and align the mounting on the top side and lateral side of the bottom case.
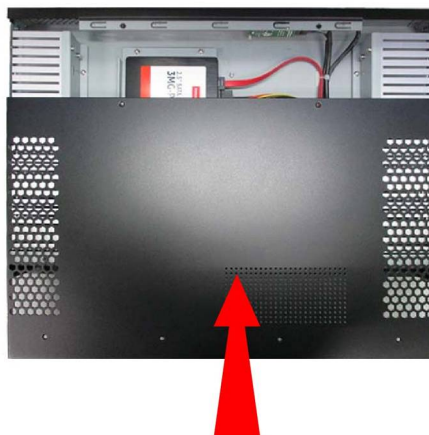
2. Insert one screw in each mounting holes and secure the top case. Use original screws.
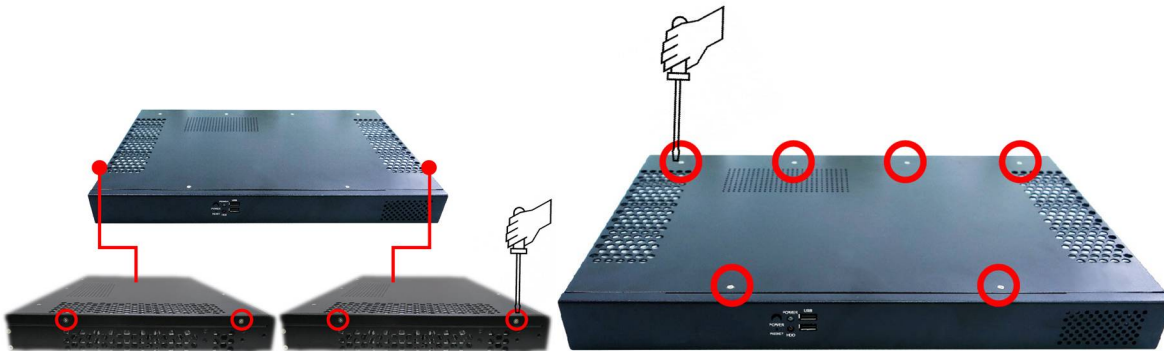
3.3 2.5" SATA HDD/SSD installation

ROC236A supports 1 x 2.5" SATA HDD/SSD

1. Remove the mounting screws and put them in a safe place for later use. Remove the HDD bracket.
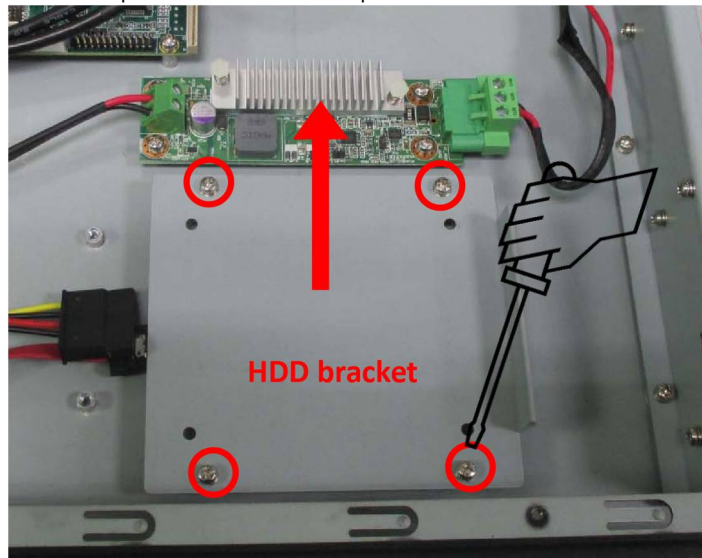
2. Align the mounting holes of SSD/HDD and HDD bracket. With the SSD/HDD right side up, place the SSD/HDD on the bracket. Make sure the connectors of SSD/HDD are toward front side

Connectors this side
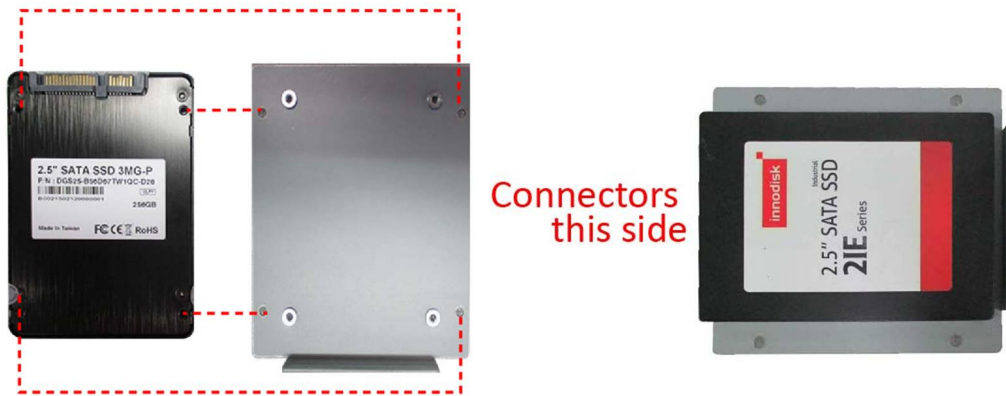
3. Turn the SSD/HDD and bracket over and insert one screw in each mounting hole on the bottom of the bracket. Using accessory item P/N: 0F0100500600100L

P/N: 0F0100500600100L
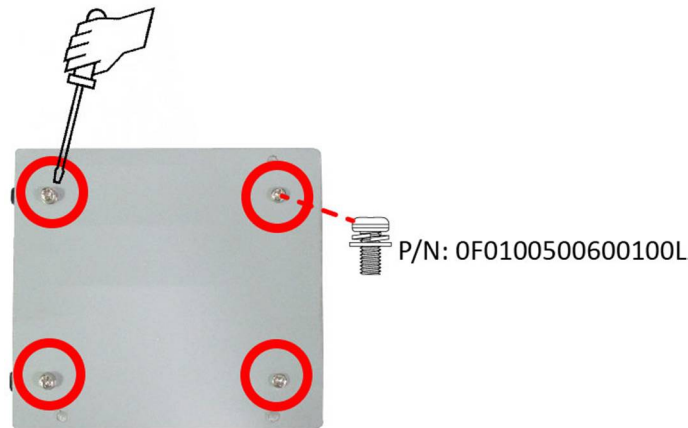
4. Replace the bracket to its original place and insert one screw in each mounting hole (using the original screws). Connect SATA-to-SATA interface cable and SATA power cable. Finally replace the top case to its original place and insert one screw in each mounting hole (using the original screws)
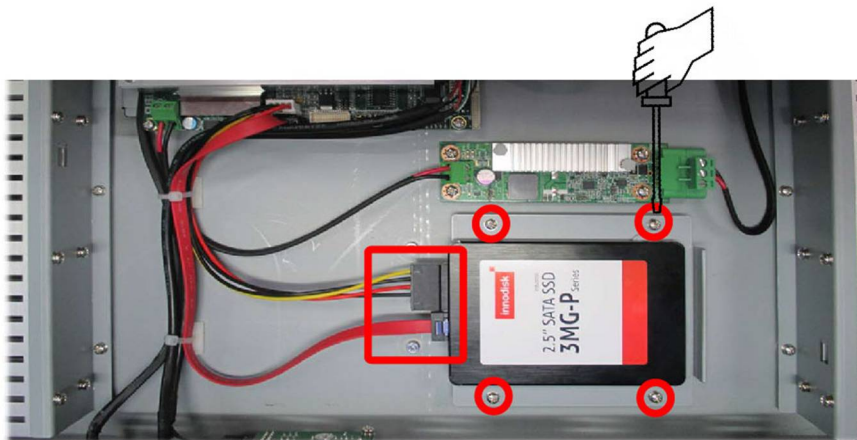
3.4 Memory module installation

ROC236A supports 1 x 204-pin SO-DIMM DDR3 1333/1600 MHz up to 8GB

1. On the bottom side, remove the mounting screws and then put them in a safe place for later use. Remove the service window then find the memory module socket.
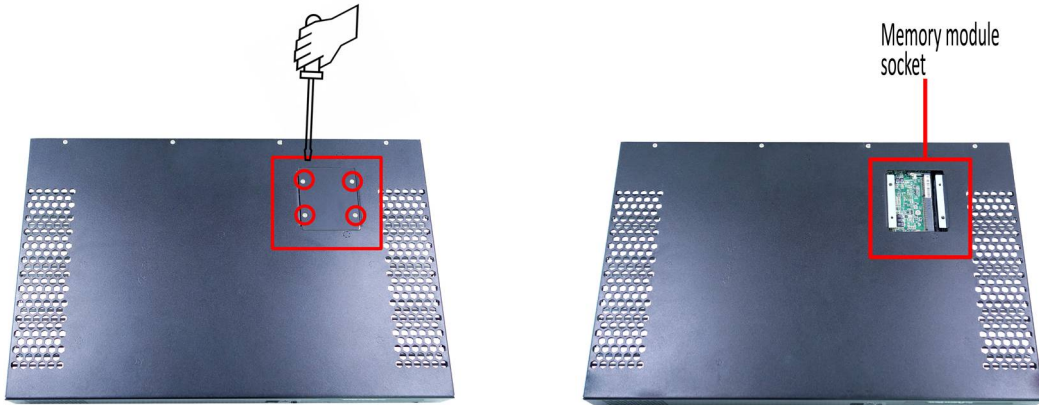
2. Insert the notched end of the memory module into the memory slot. Press the memory module in firmly, and pivot it downward until it snaps into place. Ensure that the memory module is firmly installed in the slot and does not move easily.
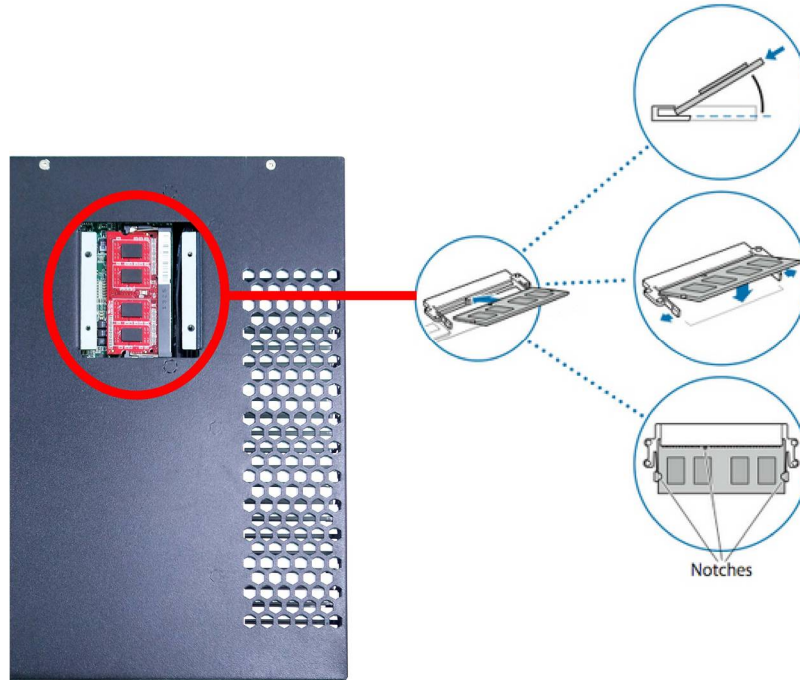
3. Finally replace the service window and secure it by insert one screw to the mounting hole. Use original screws

3.5 Rack mount bracket installation

1. Put each ear bracket next to the right side and left side of the bottom case, align the mounting holes.
2. Insert one screw in each mounting hole. Using accessory item P/N: 0F013250600000L

P/N: 0F0132500600000L
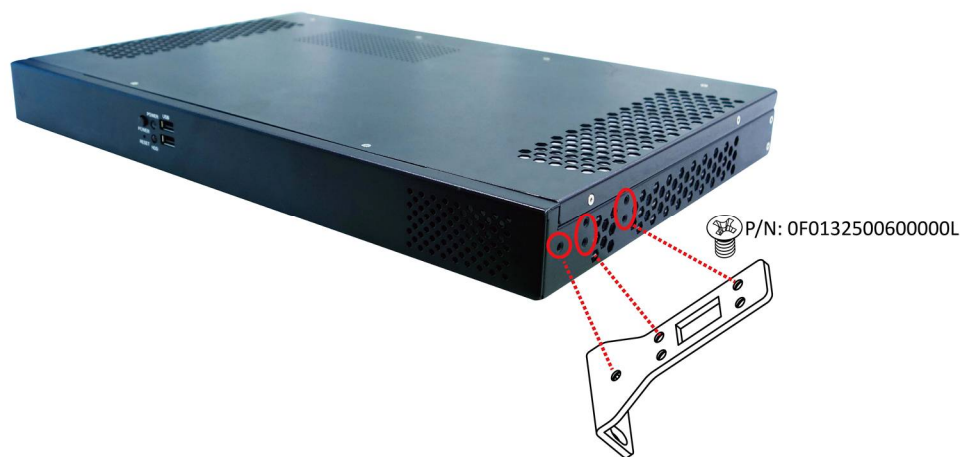
Chapter 4: AMI BIOS UTILITY

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

4.1 Starting

To enter the setup screens, perform the following steps:

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

4.2 Navigation Keys

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

	Some of the navigation keys may differ from one screen to another.

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

4.3 Main

The Main menu is the first screen that you will see when you enter the BIOS Setup Utility.

```
           Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
    Main   Advanced  Chipset  Boot  Security  Save & Exit

    BIOS Information
    BIOS Vendor                       American Megatrends
    Core Version                      4.6.5.3
    Compliancy                        UEFI 2.3; PI 1.2
    Project Version                   5336R 1.04 x64
    Build Date and Time               07/31/2014 16:32:54

    Processor Information
    Name                              IvyBridge
    Brand String                      Intel(R) Core(TM) i7-351
```

```
           Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
    Main   Advanced  Chipset  Boot  Security  Save & Exit

    Frequency                         1600 MHz              ▲  Set the Time. Use Tab to
    Processor ID                      306a9                    switch between Time elements.
    Stepping                          E1
    Number of Processors              2Core(s) / 4Thread(s)
    Microcode Revision                13
    GT Info                           GT2 (1000 MHz)

    IGFX VBIOS Version                2143
    Memory RC Version                 1.7.0.0
    Total Memory                      2048 MB (DDR3)

    PCH Information
    Name                              PantherPoint
    Stepping                          04/C1                    ++: Select Screen
    TXT Capability of Platform/PCH    Supported                ↑↓: Select Item
    LAN PHY Revision                  C0                       Enter: Select
                                                               +/-: Change Opt.
                                                               F1: General Help
                                                               F2: Previous Values
    System Language                   [English]                F3: Optimized Defaults
                                                               F4: Save & Exit
    System Date                       [Tue 09/15/2015]         ESC: Exit
    System Time                       [15:26:55]

    Access Level                      Administrator         ▼

           Version 2.15.1229. Copyright (C) 2012 American Megatrends, Inc.
```

System Language

Use this function to select the system language.

System Date

Use this function to change the system date.
Select System Date using the Up and Down <Arrow> keys. Enter the new values through the keyboard. Press the Left and Right <Arrow> keys to move between fields.
The date setting must be entered in MM/DD/YY format.

System Time

Use this function to change the system time.

Select System Time using the Up and Down <Arrow> keys. Enter the new values through the keyboard. Press the Left and Right <Arrow> keys to move between fields.

The time setting 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.

Access Level

Displays the access level of the current user in the BIOS.

4.4 Advanced

The Advanced Menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference. _**Setting incorrect field values may cause the system to malfunction.**_
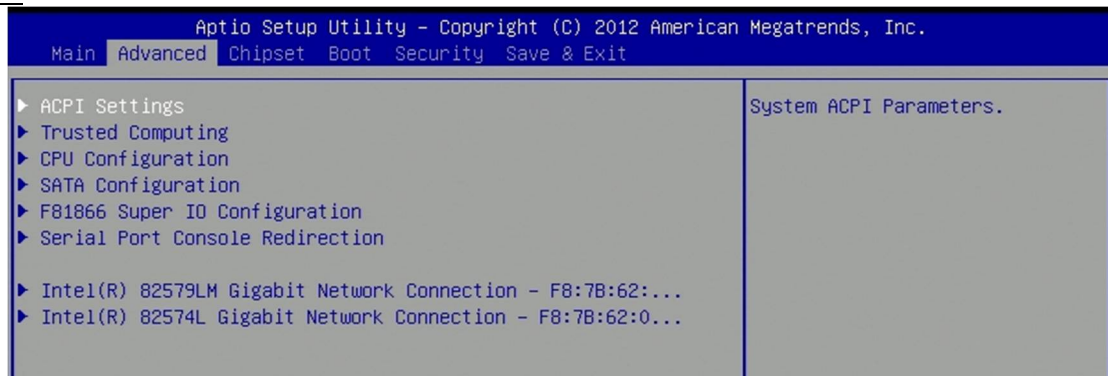
ACPI Settings System ACPI parameters

Trusted Computing Trusted Computing settings

CPU Configuration CPU Configuration parameters

SATA Configuration SATA device options settings

F81866 Super IO Configuration System Super IO chip parameters

Serial Port Console Redirection serial port console redirection

Intel 82579LM Gigabit Network Connection Configure Gigabit Ethernet device parameters

Intel 82574L Gigabit Network Connection Configure Gigabit Ethernet device parameters

4.4.1 ACPI Settings

System ACPI parameters

```
             Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
      Advanced

  ACPI Settings                                              Select ACPI sleep state the
                                                             system will enter when the
                                                             SUSPEND button is pressed.
  ACPI Sleep State                    [S3 only(Suspend to ...]
```

ACPI Sleep State Select ACPI sleep state the system will enter when the SUSPEN button is pressed.

4.4.2 Trusted Computing

Trusted Computing settings

```
             Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
      Advanced

  Configuration                                              Enables or Disables BIOS
    Security Device Support           [Disable]              support for security device.
                                                             O.S. will not show Security
                                                             Device. TCG EFI protocol and
                                                             INT1A interface will not be
  Current Status Information                                 available.
    NO Security Device Found
```

Security Device Support Enables or disables BIOS support for security device. OS will not show security device. TCG EFI protocol and INT1A interface will not be available.

4.4.3 CPU Configuration

CPU Configuration parameters

```
             Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
      Advanced

  CPU Configuration

  Intel(R) Core(TM) i7-3517UE CPU @ 1.70GHz
  CPU Signature                   306a9
  Microcode Patch                 13
  Max CPU Speed                   1700 MHz
  Min CPU Speed                   800 MHz
  CPU Speed                       1600 MHz
  Processor Cores                 2
  Intel HT Technology             Supported
  Intel VT-x Technology           Supported
  Intel SMX Technology            Supported
  64-bit                          Supported
                                                             →←: Select Screen
  L1 Data Cache                   32 kB x 2                  ↑↓: Select Item
  L1 Code Cache                   32 kB x 2                  Enter: Select
  L2 Cache                        256 kB x 2                 +/-: Change Opt.
  L3 Cache                        4096 kB                    F1: General Help
                                                             F2: Previous Values
                                                             F3: Optimized Defaults
                                                             F4: Save & Exit
```

4.4.4 SATA Configuration
SATA device options settings

```
                Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
        Advanced

    SATA Mode Selection              [IDE]               Determines how SATA
                                                         controller(s) operate.
    Serial ATA Port 0              Empty
      Software Preserve            Unknown
    Serial ATA Port 1              Empty
      Software Preserve            Unknown
    Serial ATA Port 2              Empty
      Software Preserve            Unknown
    Serial ATA Port 3              Empty
      Software Preserve            Unknown
    Serial ATA Port 4              Empty
      Software Preserve            Unknown
    Serial ATA Port 5              Empty
      Software Preserve            Unknown          →←: Select Screen
                                                    ↑↓: Select Item
                                                    Enter: Select
```

SATA Mode Selection
Determination how SATA controllers operate

4.4.5 F81866 Super IO Configuration
System Super IO chip parameters

```
                Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
        Advanced

    F81866 Super IO Configuration                       Set Parameters of Serial Port
                                                         0 (COMA)
    F81866 Super IO Chip           F81866
  ▶ Serial Port 0 Configuration
  ▶ Serial Port 1 Configuration
  ▶ Serial Port 2 Configuration
  ▶ Serial Port 3 Configuration
  ▶ Parallel Port Configuration
  ▶ GPIO Configuration
```
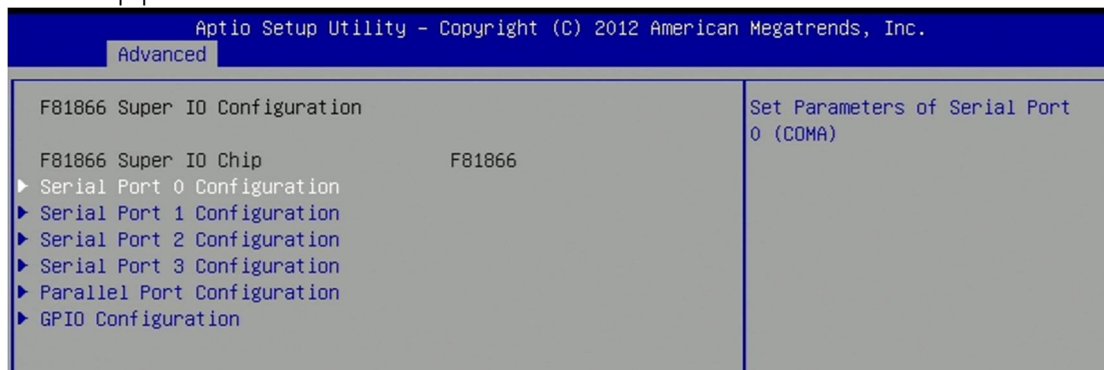
Serial Port 0/1/2/3 Configuration Set parameters of serial port 0/1/2/3 (COMA/B/C/D)
Parallel Port Configuration Set parameters of parallel port (LPT/LPTE)
GPIO Configuration GPIO configuration settings

4.4.5.1 Serial Port 0/1/2/3 Configuration

```
         Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
     Advanced

 Serial Port 0 Configuration                        Enable or Disable Serial Port
                                                    (COM)
 Serial Port                   [Enabled]
 Device Settings               IO=3F8h; IRQ=4;

 Change Settings               [Auto]
```

```
         Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
     Advanced

 Serial Port 1 Configuration                        Enable or Disable Serial Port
                                                    (COM)
 Serial Port                   [Enabled]
 Device Settings               IO=2F8h; IRQ=3;

 Change Settings               [Auto]
 Mode                          [RS-232]
```

```
         Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
     Advanced

 Serial Port 2 Configuration                        Enable or Disable Serial Port
                                                    (COM)
 Serial Port                   [Enabled]
 Device Settings               IO=3E8h; IRQ=7;

 Change Settings               [Auto]
```

```
         Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
     Advanced

 Serial Port 3 Configuration                        Enable or Disable Serial Port
                                                    (COM)
 Serial Port                   [Enabled]
 Device Settings               IO=2E8h; IRQ=7;

 Change Settings               [Auto]
```

Serial Port Enable or disable serial port (COM)
Change settings Select an optimal setting for Super IO device.
Mode RS232, RS422, RS485 selection

4.4.5.2 Parallel Port Configuration
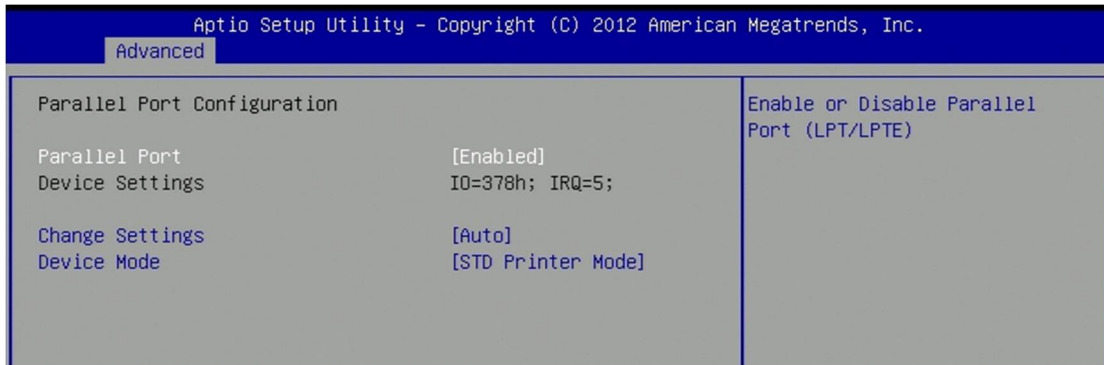
Parallel Port Enable or disable parallel port (LPT/LPTE)
Device Mode Change the printer port mode

4.4.5.3 GPIO Configuration
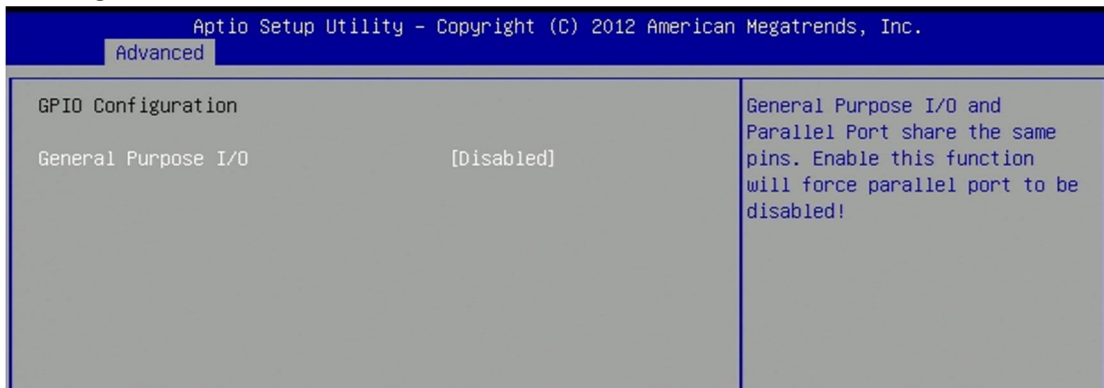
General Purpose I/O General Purpose I/O and parallel port share the same pins. Enable this function will force parallel port to be disabled.

4.4.6 Serial Port Console Redirection

Serial port console redirection

Console redirection Console redirection enable or disable.

Console redirection settings The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computer should have the same or compatible settings.
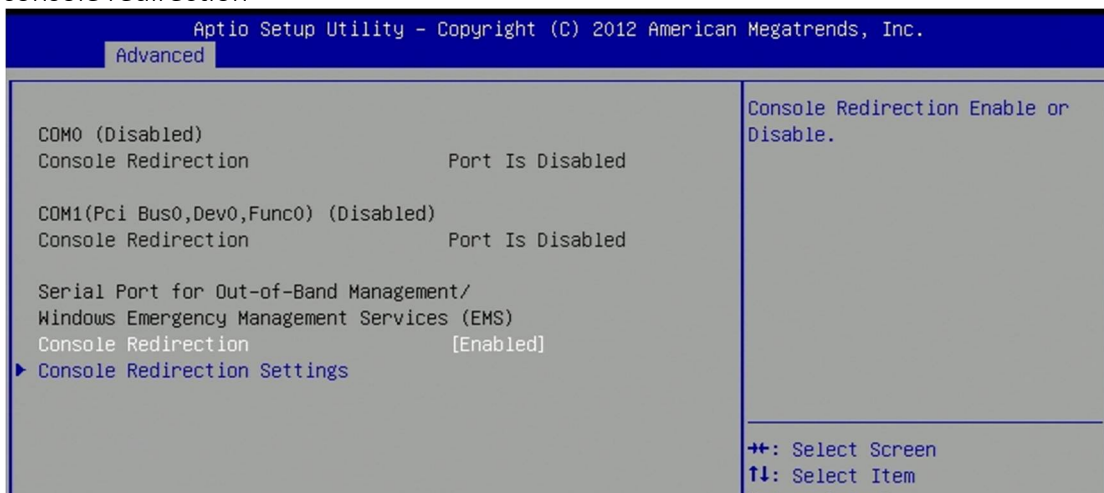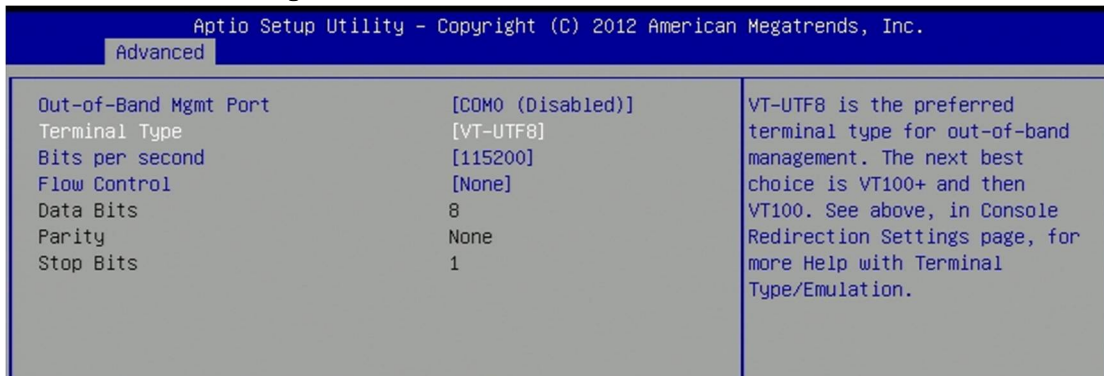
4.4.6.1 Console redirection settings

```
           Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
    Advanced

 Out-of-Band Mgmt Port        [COM0 (Disabled)]      VT-UTF8 is the preferred
 Terminal Type                [VT-UTF8]              terminal type for out-of-band
 Bits per second              [115200]              management. The next best
 Flow Control                 [None]                choice is VT100+ and then
 Data Bits                    8                     VT100. See above, in Console
 Parity                       None                  Redirection Settings page, for
 Stop Bits                    1                     more Help with Terminal
                                                    Type/Emulation.
```
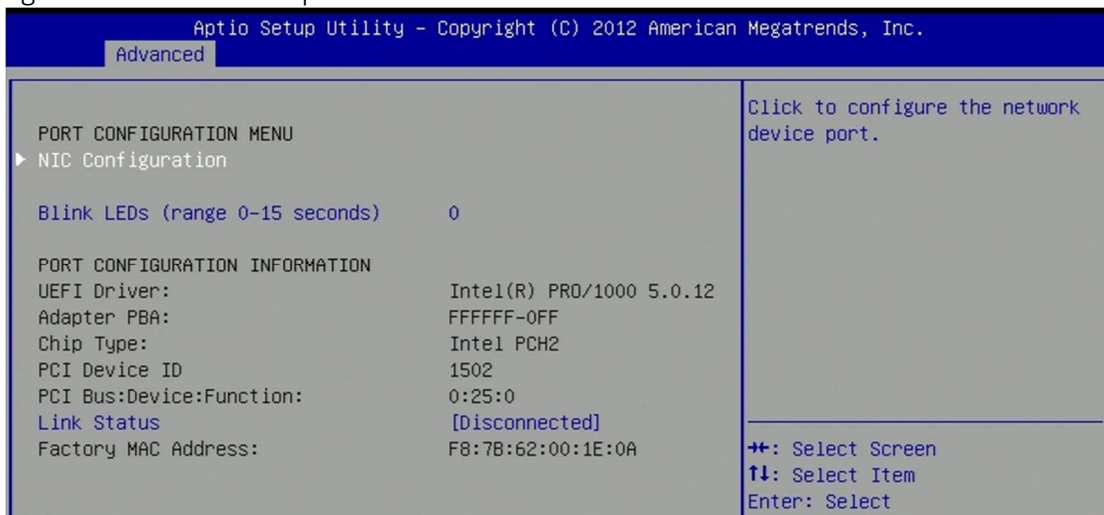
Out-of-Band Mgmt Port VT-UTF8 is the preferred terminal type for out-of-band management. The next best choice is VT100+ and then VT100. See above, in Console Redirection settings page, for more help with terminal type/emulation.

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

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

4.4.7 Intel 82579LM Gigabit Network Connection/ Intel 82574L Gigabit Network Connection
Configure Gigabit Ethernet device parameters

```
           Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
    Advanced
                                                    Click to configure the network
                                                    device port.
 PORT CONFIGURATION MENU
 ▶ NIC Configuration

 Blink LEDs (range 0-15 seconds)      0

 PORT CONFIGURATION INFORMATION
 UEFI Driver:                    Intel(R) PRO/1000 5.0.12
 Adapter PBA:                    FFFFFF-0FF
 Chip Type:                      Intel PCH2
 PCI Device ID                   1502
 PCI Bus:Device:Function:        0:25:0
 Link Status                     [Disconnected]
 Factory MAC Address:            F8:7B:62:00:1E:0A      →←: Select Screen
                                                        ↑↓: Select Item
                                                        Enter: Select
```
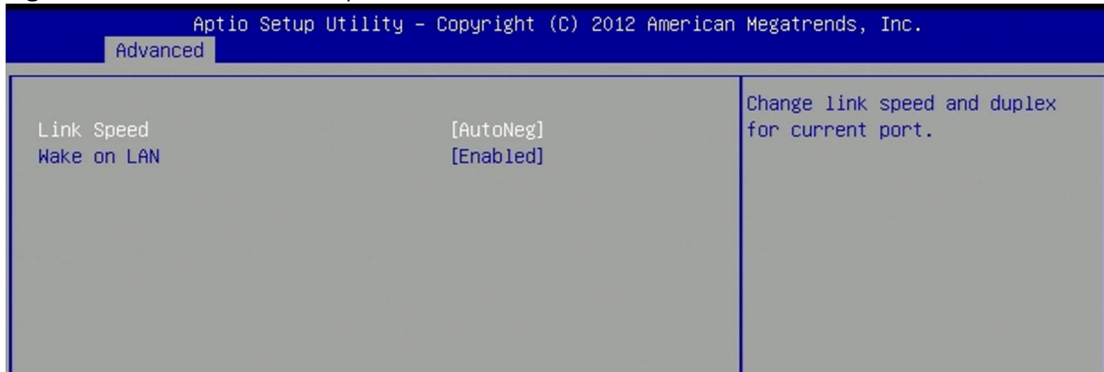
NIC Configuration Click to configure the network device port.
Blink LEDs (range 0-15 seconds) Blink LEDs for the specified duration (up to 15 seconds)

4.4.7.1 NIC Configuration

Click to configure the network device port.

```
Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
 Advanced

 Link Speed                    [AutoNeg]          Change link speed and duplex
 Wake on LAN                   [Enabled]          for current port.
```

Link Speed Change link speed and duplex for current port.
Wake on LAN Enable this option to wake the system with a magic packet.

4.5 Chipset

This section gives you functions to configure the system based on the specific features of the chipset. The chipset manages bus speeds and access to system memory resources.

```
Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
 Main  Advanced  Chipset  Boot  Security  Save & Exit

 ▶ System Agent (SA) Configuration                System Agent (SA) Parameters
```

4.5.1 System Agent (SA) Configuration

System Agent (SA) parameters.

```
Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
 Chipset

 System Agent Bridge Name      IvyBridge          Check to enable VT-d function
 System Agent RC Version       1.7.0.0            on MCH.
 VT-d Capability               Supported

 VT-d                          [Enabled]

 ▶ Graphics Configuration
 ▶ Memory Configuration
```

VT-d Check to enable VT-d function on MCH.
Graphics Configuration Config graphic settings
Memory Configuration Memory configuration parameters

4.5.1.1 Graphics Configuration

```
             Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
               Chipset

 Graphics Configuration                              LCD Control
 IGFX VBIOS Version              2143
 IGfx Frequency                  350 MHz

▶ LCD Control
```

4.5.1.1.1 LCD Control

```
             Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
               Chipset

 LCD Control                                         Select Secondary Display Device

 Primary IGFX Boot Display        [CRT]
 Secondary IGFX Boot Display      [EFP3 (DVI)]
 LCD Panel Type                   [1024x768      LVDS]
 SDVO-LFP Panel Type              [VBIOS Default]
 Panel Scaling                    [Auto]
 Backlight Control                [PWM Normal]
 BIA                              [Auto]
 Spread Spectrum clock Chip       [Off]
 TV1 Standard                     [VBIOS default]
 TV2 Standard                     [VBIOS default]
 ALS Support                      [Disabled]
 Active LFP                       [Int-LVDS]           ↔: Select Screen
 Panel Color Depth                [18 Bit]             ↑↓: Select Item
                                                       Enter: Select
                                                       +/-: Change Opt.
                                                       F1: General Help
                                                       F2: Previous Values
```
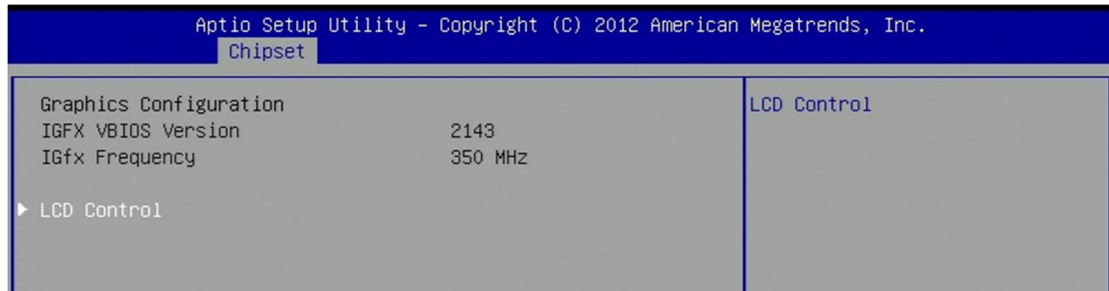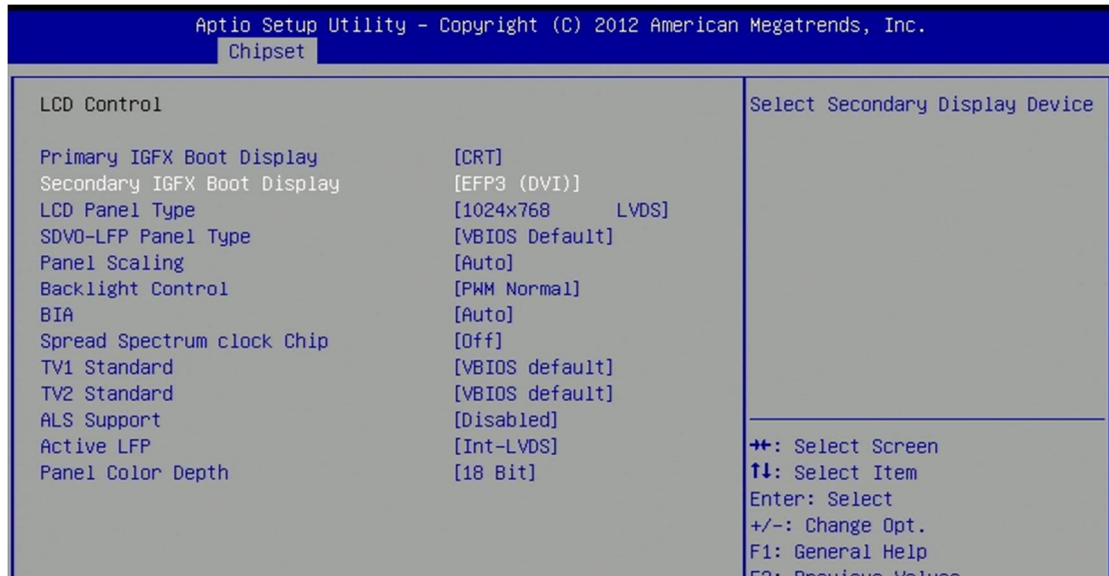
Primary IGFX Boot Display Select the Video Device which will be activated during POST. This has no effect if external graphics present. Secondary boot display selection will appear based on your selection. VGA modes will be supported only on primary display.

Secondary IGFX Boot Display Select secondary display device.

LCD Panel Type Select LCD panel used by Internal Graphics Device by selecting the appropriate setup item.

SDVO-LFP Panel Type Select the SDVO panel used by Internal Graphics Device by selecting the appropriate setup item.

Panel Scaling Select the LCD panel scaling option used by the Internal Graphic Device.

Backlight Control Backlight control setting

BIA
>>Auto: GMCH Use VBT Default;
>>Level1 n: Enabled with the selected aggressiveness level1.

Spread Spectrum clock chip
>>Hardware: Spread is controlled by chip;
>>Software: Spread is controlled by BIOS

TV1 Standard Select the ability to configure a TV format.

TV2 Standard Select the ability to configure a TV Minor Format

ALS Support
Valid only for ACPI.
Legacy=ALS support through the IGD INT10 function.
ACPI=ALS support through an ACPI ALS driver

Active LFP
Select the Active LFP configuration.
NO LVDS: VBIOS does not enable LVDS.
Int-LVDS: VBIOS enables LVDS driver by integrated encoder.
SDVO LVDS: VBIOS enables LVDS driver by SDVO encoder.
eDP port-A: LFP driven by Int-DisplayPort encoder from Port-A.

Panel color Depth Select the LFP panel color depth.

4.5.1.2 Memory Configuration
Memory configuration parameters

```
         Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
          Chipset

  Memory Information

  Memory RC Version              1.7.0.0
  Total Memory                   2048 MB (DDR3)
  DIMM#0                         2048 MB (DDR3)
  DIMM#1                         Not Present
  DIMM#2                         Not Present
  DIMM#3                         Not Present
  CAS Latency (tCL)              9
  Minimum delay time
      CAS to RAS (tRCDmin)       9
      Row Precharge (tRPmin)     9
      Active to Precharge (tRASmin)  24
  XMP Profile 1                  Not Supported
  XMP Profile 2                  Not Supported

                                               ++: Select Screen
                                               ↑↓: Select Item
                                               Enter: Select
                                               +/-: Change Opt.
```

4.6 Boot

This section is used to configure the boot features.
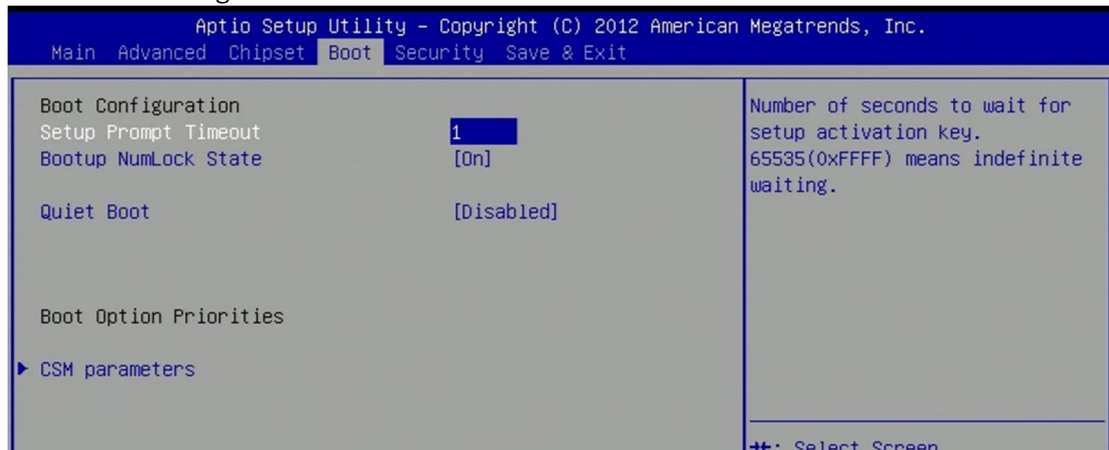
Setup Prompt Timeout Number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting.

Bootup NumLock State Select the keyboard NumLock state.

Quiet Boot Enables or disables quiet boot option.

CSM Parametes OpROM execution, boot options filter, etc.
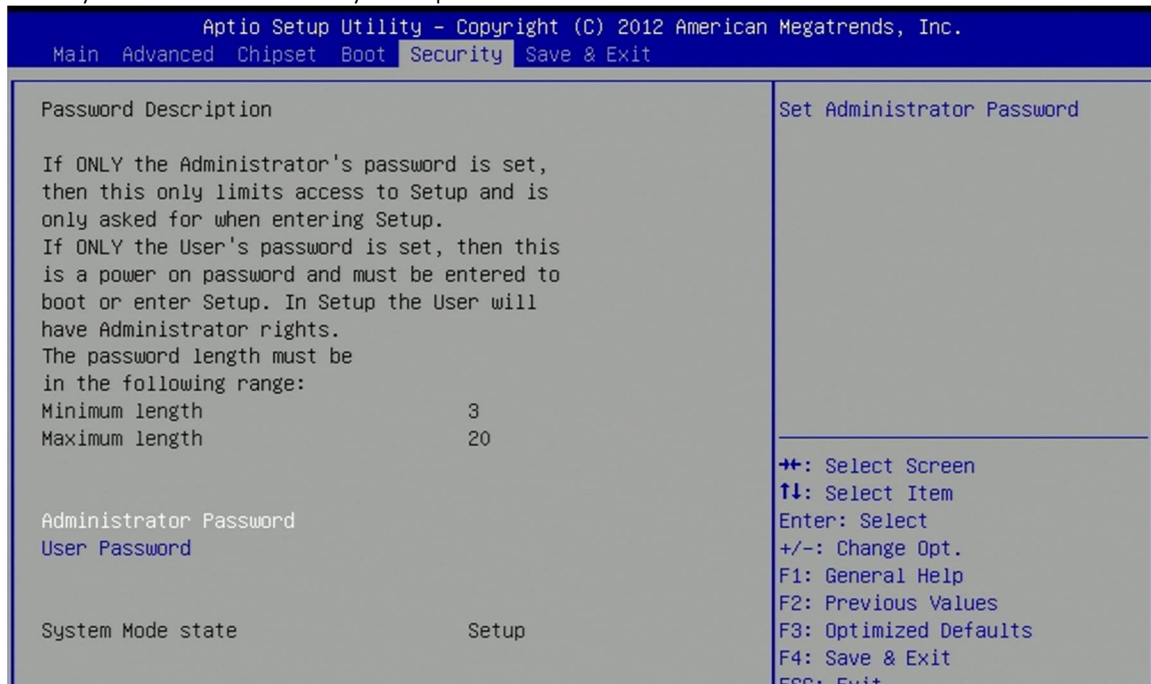
4.6.1 CSM Parametes

Launch PXE OpROM policy Controls the execution of UEFI and Legacy PXE OpROM.

Launch Storage OpROM policy Controls the execution of UEFI and Legacy Storage OpROM.

4.7 Security

Use the Security Menu to establish system passwords

```
              Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
   Main  Advanced  Chipset  Boot  Security  Save & Exit

   Password Description                              | Set Administrator Password
                                                     |
   If ONLY the Administrator's password is set,      |
   then this only limits access to Setup and is      |
   only asked for when entering Setup.               |
   If ONLY the User's password is set, then this     |
   is a power on password and must be entered to     |
   boot or enter Setup. In Setup the User will       |
   have Administrator rights.                         |
   The password length must be                        |
   in the following range:                            |
   Minimum length            3                        |
   Maximum length            20                       |_____
                                                      | ++: Select Screen
                                                      | ↑↓: Select Item
   Administrator Password                             | Enter: Select
   User Password                                      | +/-: Change Opt.
                                                      | F1: General Help
                                                      | F2: Previous Values
   System Mode state         Setup                    | F3: Optimized Defaults
                                                      | F4: Save & Exit
                                                      | ESC: Exit
```

Administrator Password Set administrator password
User Password Set user password

4.8 Save & Exit

This screen provides functions for handling changes made to the BIOS settings and the exiting of the Setup program.
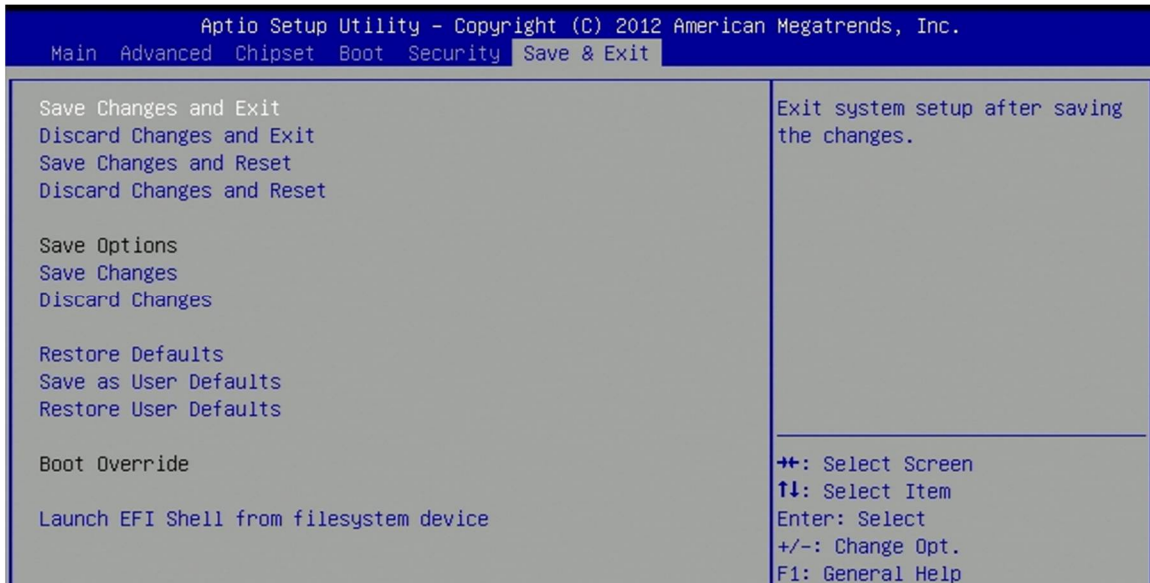
Save Changes and Exit Exit System setup after saving the changes
Discard Changes and Exit Exit system setup without saving any changes
Save Changes and Reset Reset the system after saving the changes
Discard Changes and Reset Reset the system setup without saving any changes
Save Changes Save changes done so far to any of the setup options
Discard Changes Discard changes done so far to any of the setup options
Restore Defaults Restore/Load default values for all the setup options.
Save as User Defaults Save the changes done so far as user defaults.
Restore User Defaults Restore the user defaults to all the setup options.
Launch EFI Shell from filesystem device Attempts to Launch EFI Shell application (Shellx64.efi) from one