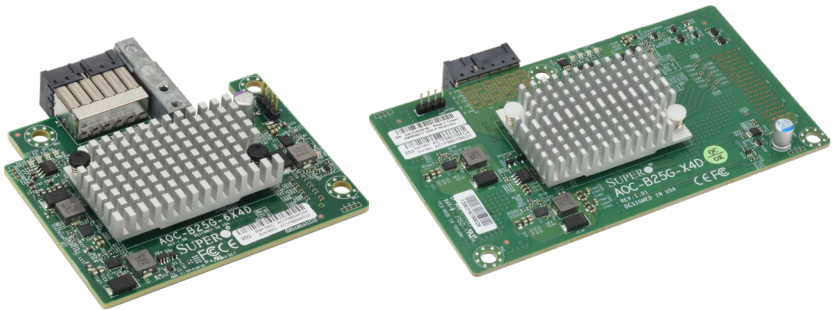




# AOC-B25G-6X4D/X4D



## User's Guide

Revision 1.0a

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User's Guide Revision 1.0a

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## Preface

### About this User's Guide

This user's guide is written for system integrators, PC technicians, and knowledgeable PC users. It provides information for the installation and use of the AOC-B25G-6X4D/X4D add-on card.

### About this Add-on Card

The Supermicro® AOC-B25G-6X4D/X4D is one of the most feature-rich 25GbE controllers in the market. With built-in 25GbE connectivity, it provides unparalleled density, performance, and functionality. Based on the Mellanox® ConnectX-4 Lx EN with features such as VXLAN, NVGRE, and RoCE, it provides flexible connectivity to meet different networking requirements. It is also compatible with 10GbE networks and provides cost-effective upgrade from 10GbE to 25GbE in data centers and cloud deployments.

### An Important Note to the User

All images and layouts shown in this user's guide are based upon the latest PCB revision available at the time of publishing. The card you have received may or may not look exactly the same as the graphics shown in this user's guide.

### Returning Merchandise for Service

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service will be rendered. You can obtain service by calling your vendor for a Returned Merchandise Authorization (RMA) number. When returning the add-on-card to the manufacturer, the RMA number should be prominently displayed on the outside of the shipping carton, and the shipping package is mailed prepaid or hand-carried. Shipping and handling charges will be applied for all orders that must be mailed when service is complete. For faster service, You can also request a RMA authorization online (<http://www.supermicro.com>).

This warranty only covers normal consumer use and does not cover damages incurred in shipping or from failure due to the alternation, misuse, abuse, or improper maintenance of products.

During the warranty period, contact your distributor first for any product problems.

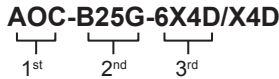
## Conventions Used in the User's Guide

Pay special attention to the following symbols for proper system installation and to prevent damage to the system or injury to yourself:



**Note:** Additional information given to differentiate between various models or provides information for correct system setup.

## Naming Convention



Character	Representation	Options
1st	Product Family	<b>AOC:</b> Add On Card
2nd	Product Type/Speed	<b>GEH:</b> GbE (1Gb/s) <b>XEH:</b> 10GbE (10Gb/s) <b>B25G:</b> 25GbE (25Gb/s) <b>IBH:</b> Infiniband <b>OPH:</b> Omni-Path
3rd	Chipset	<b>X4D/6X4D:</b> Mellanox ConnectX-4 Lx EN <b>X4ES:</b> Mellanox ConnectX-4 VPI <b>I2M:</b> Intel® Ethernet Controller X710-BM2 <b>I4M:</b> Intel Ethernet Controller I350-AM4 <b>IN2:</b> Intel Ethernet Controller 82599 <b>WFR:</b> Intel Omni-Path Wolfriver

## SMC Blade Networking Add-on Cards

Model	Type	Form Factor	Controller	Connection	Dimension (mm)	Power (W)	Where used
AOC-XEH-I2M	10GbE	Proprietary	Intel Ethernet Controller X710-BM2	2x 10GbE	76.58 x 46.56	3.04W typical, 5.63W max	Microblade 3U/6U
AOC-GEH-I4M	1GbE	Proprietary	Intel Ethernet Controller I350-AM4	4x 1GbE	76.58 x 46.56	2.1W typical, 2.6W max	Microblade 3U/6U
AOC-IBH-X4ES	EDR IB	Proprietary	Mellanox ConnectX-4 VPI	1x 100Gb/s InfiniBand port	75.1 x 133.5	12.5W typical, 14.6W max	SuperBlade 8U (SBE-820C)
AOC-XEH-IN2	10GbE	Proprietary	Intel Ethernet Controller 82599	2x 10GbE	71.35 x 59.5	6.25W max	SuperBlade 7U
AOC-OPH-WFR	Omni-Path	Proprietary	Intel Omni-Path Wolfriver	1x 100Gb/s	75.1 x 133.5	13.12W typical, 16.65W max	SuperBlade 8U (SBE-820C)
AOC-B25G-X4D	25GbE	Proprietary	Mellanox ConnectX-4 Lx EN	2x 25GbE or 10GbE	75.1 x 133.5	12.5W typical, 14.6W max	SuperBlade 8U (SBE-820J)
AOC-B25G-6X4D	25GbE	Proprietary	Mellanox ConnectX-4 Lx EN	2x 25GbE or 10GbE	73.5 x 87	12.5W typical, 14.6W max	SuperBlade 6U (SBE-610J)

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# Table of Contents

## **Preface**

### **Chapter 1 Overview**

1-1	Overview .....	1-1
1-2	Key Features .....	1-1
1-3	Specifications .....	1-2
1-4	Available SKUs .....	1-4

### **Chapter 2 Hardware Components**

2-1	Add-On Card Image and Layout .....	2-1
2-2	Major Components .....	2-2

### **Chapter 3 Installation**

3-1	Static-Sensitive Devices .....	3-1
3-2	Before Installation .....	3-2
3-3	Add-on Card Installation .....	3-2
3-4	Installing Drivers (for Mellanox ConnectX-4 Lx En) .....	3-4
3-5	Configuring EFI mode from System Setup .....	3-6

# Chapter 1


## Overview

### 1-1 Overview

Congratulations on purchasing your add-on card from an acknowledged leader in the industry. Supermicro products are designed with the utmost attention to detail to provide you with the highest standards in quality and performance. For product support and updates, please refer to our website at <http://www.supermicro.com/products/nfo/networking.cfm#adapter>.

### 1-2 Key Features

The key features of this add-on card include:

- Supermicro Blade Mezzanine Card
- Mellanox ConnectX-4 Lx EN 25GbE controller, supporting two 25G, or 10G ports
- Hardware offloads for NVGRE, VXLAN, and GENEVE encapsulated traffic
- SR-IOV for virtualization
- Low latency RDMA over Converged Ethernet (RoCE)
- Jumbo frames support
- NC-SI for remote management
- Asset Management features with thermal sensor
- RoHS compliant 6/6 

## 1-3 Specifications

### General

- Supermicro Blade Mezzanine Card
- Mellanox ConnectX-4 Lx EN 25GbE Controller

### Ethernet

- 25GbE/10GbE
- IEEE 802.3ad, 802.1AX Link Aggregation
- IEEE 802.1Q, 802.1P VLAN tags, and priority
- IEEE 1588v2
- Jumbo frames support

### Enhanced Features

- Hardware-based reliable transport
- Collective operations offloads
- Vector collective operations offloads
- 64/66 encoding
- Dynamically Connected Transport (DCT)
- Enhanced atomic operations
- Support for MSI/MSI-X mechanisms

### Storage Offloads

- Stateless offloads for overlay networks and tunneling protocols
- Hardware offload of encapsulation of NVGRE and VXLAN overlay networks

## Hardware-based I/O Virtualization

- Single root IOV
- Multi-function per port
- Multiple queues per virtual machine
- VMware NetQueue support

## Virtualization

- SR-IOV: Up to 256 virtual functions
- SR-IOV: Up to 16 physical functions per port

## CPU Offloads

- RDMA over Converged Ethernet (RoCE)
- TCP/UDP/IP stateless offload
- LSO, LRO, checksum offload
- RSS (can be done on encapsulated packet), TSS, HDS, VLAN insertion/stripping, receive flow steering
- Intelligent interrupt coalescence

## Management Features

- Remote boot over iSCSI
- PXE and UEFI
- NC-SI for remote management

## Power Consumption

- 12.5W typical / 14.6W max

## Operating Conditions

- Operating temperature: 0°C to 55°C (32°F to 131°F)
- Storage temperature: -40°C to 70°C (-40°F to 158°F)
- Storage humidity: 90% non-condensing relative humidity at 35°C

## Physical Dimensions

- AOC-B25G-6X4D Card PCB dimensions: 73.5mm (2.89in) x 87mm (3.42in)  
(W x D)
- AOC-B25G-X4D Card PCB dimensions: 75.1mm (2.95in) x 133.5mm (5.25in)  
(W x D)

## Supported Platforms

- Supermicro SuperBlade™ motherboard with mezzanine slots



**Note:** This product is sold only as part of an integrated solution with Supermicro SuperBlade systems.

## 1-4 Available SKUs

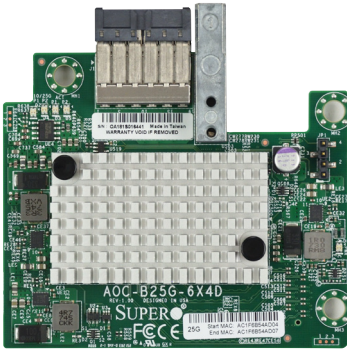
SKUs	Part Number	Description
AOC-B25G-6X4D	AOC-B25G-6X4D	2-port 25 Gigabit Ethernet Adapter in SuperBlade 6U chassis
AOC-B25G-X4D	AOC-B25G-X4D	2-port 25 Gigabit Ethernet Adapter in SuperBlade 8U chassis

## Chapter 2

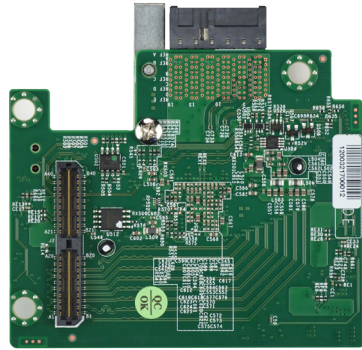
### Hardware Components

#### 2-1 Add-On Card Image and Layout

##### Image of AOC-B25G-6X4D

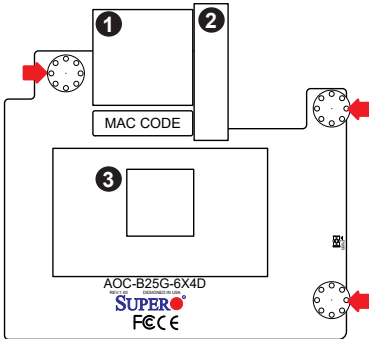


Top View

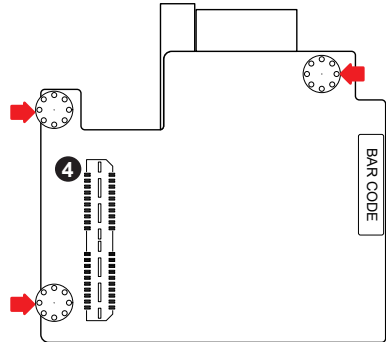


Bottom View

##### Layout of AOC-B25G-6X4D



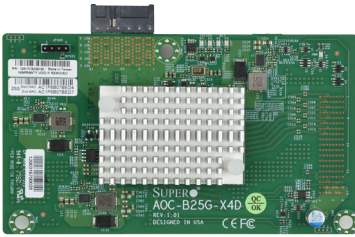
Top View



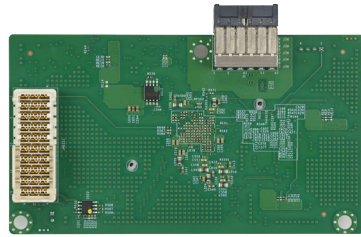
Bottom View

1. Board to Board Connector	4. Q Strip® Connector
2. Guide Pin	➡ Mounting Holes
3. Mellanox ConnectX-4 Lx EN	

**Image of AOC-B25G-X4D**

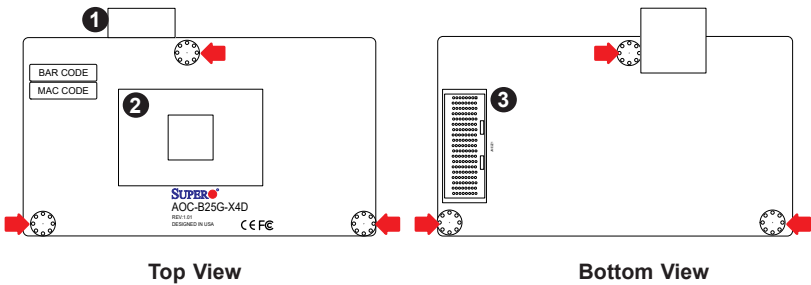


**Top View**



**Bottom View**

**Layout of AOC-B25G-X4D**



**Top View**

**Bottom View**

1. Board to Board Connector	3. ExaMEZZ® Connector
2. Mellanox ConnectX-4 Lx EN	➔ Mounting Holes

**2-2 Major Components**

The following major components are built-in on the AOC-B25G-6X4D/X4D:

1. One (1) Mellanox ConnectX-4 Lx EN
2. One (1) Q Strip Connector on AOC-B25G-6X4D
3. One (1) ExaMEZZ Connector on AOC-B25G-X4D
4. One (1) Board to Board Connector

## Chapter 3

# Installation

### 3-1 Static-Sensitive Devices

Electrostatic Discharge (ESD) can damage electronic components. To avoid damaging your add-on card, it is important to handle it very carefully. The following measures are generally sufficient to protect your equipment from ESD.

#### Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing the add-on card from the antistatic bag.
- Handle the add-on card by its edges only; do not touch its components.
- Put the add-on card back into the antistatic bags when not in use.
- For grounding purposes, make sure that your system chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the add-on card.

#### Unpacking

The add-on card is shipped in antistatic packaging to avoid static damage. When unpacking your component or system, make sure you are static protected.



**Note:** To avoid damaging your components and to ensure proper installation, always connect the power cord last, and always unplug it before adding, removing, or changing any hardware components.

## 3-2 Before Installation

Before you install the add-on card, follow the instructions below.

1. Use industry-standard anti-static equipment such as gloves or a wrist strap and follow the precautions on [page 3-1](#) to avoid damage caused by ESD.
2. Familiarize yourself with the server, motherboard, and/or chassis documentation.
3. Confirm that your operating system includes the latest updates and hotfixes.

## 3-3 Add-on Card Installation

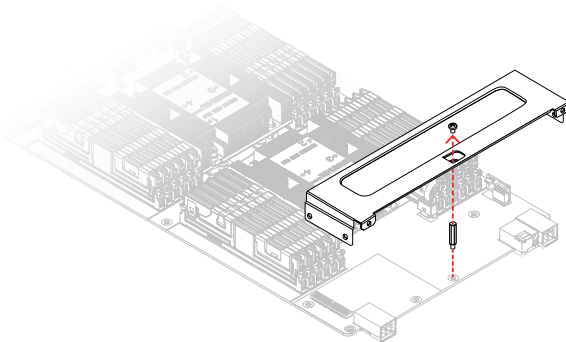
Follow the steps below to install the add-on card into your system.



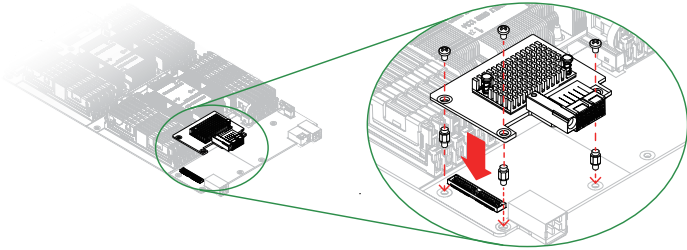
**Note 1:** This add-on card does not support hot plug.

**Note 2:** The installation described below is for AOC-B25G-6X4D, you may refer to this section as a reference when installing AOC-B25G-X4D.

1. Remove the CPU Blade from the enclosure.
2. Remove the add-on card slot cover from the chassis, and place the screws aside for later use.

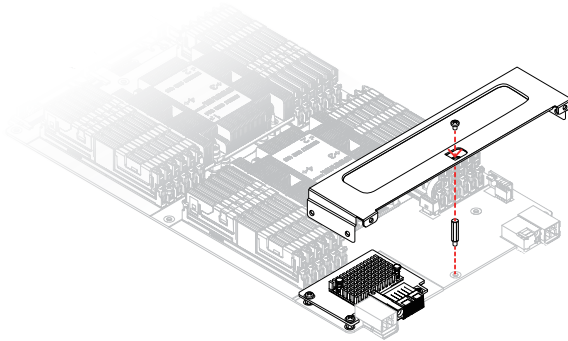


3. Insert the standoffs into the motherboard's mounting holes. Place the add-on card upper of the motherboard, align the mounting holes and add-on card slot. Gently push the add-on card slot to the corresponding slot on the motherboard, and then secure it.



**Note:** To avoid the motherboard damaged, **DO NOT** overtighten the screws.

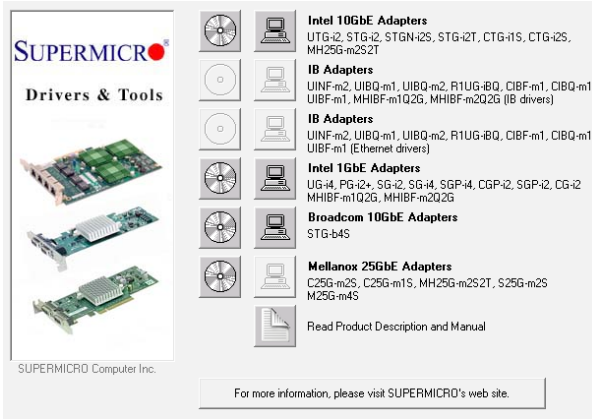
4. Secure the add-on card slot cover to the chassis.



5. Re-insert the CPU Blade into the enclosure.

### 3-4 Installing Drivers (for Mellanox ConnectX-4 Lx En)

Use the procedures below to install drivers for Linux.




#### Linux Drivers

Use the following procedures to install drivers on the Linux operating system.

Installing Mellanox Drivers for the Linux Operating System.

1. Go to Mellanox Support website to download the driver.

 **Note:** To avoid the compatible issue, beware of the software version before installing the driver. It's recommended to download the latest version if multiple drivers are available on the website.

2. Install the driver by entering the following commands:

```
tar xzvf MLNX_OFED-<ver>.tgz
cd OFED-<ver>
./mlnoxfedinstall --wihout-fw-update
```

This installs the Linux drivers to your system. For more driver installation information, please refer to Mellanox Support website.

## Windows Drivers

Use the following procedures to install drivers on the Windows operating system.

### Installing Mellanox Drivers for the Windows Operating System

1. Go to Mellanox Support website to download the driver.



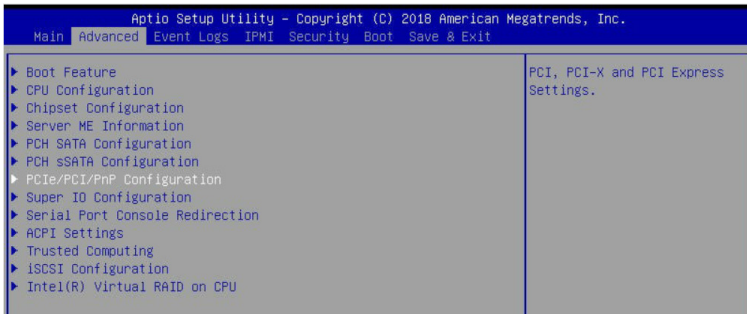
**Note:** To avoid the compatible issue, beware of the software version before installing the driver. It's recommended to download the latest version if multiple drivers are available on the website.

2. Choose the desired Windows driver package file.
3. Double-click to run and install the driver package file.

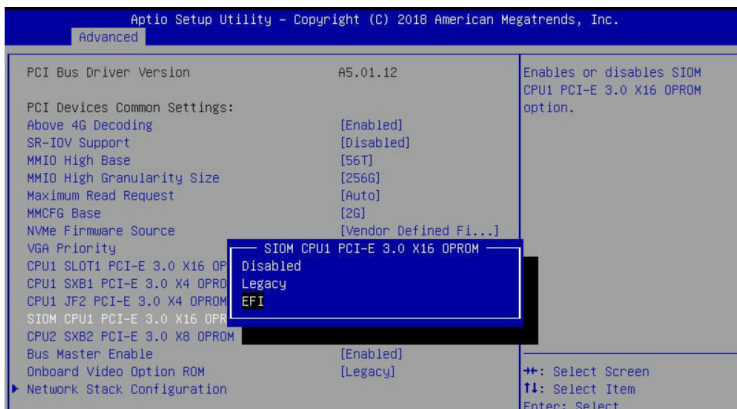
### 3-5 Configuring EFI mode from System Setup

During the host boot process, EFI mode configuration can be modified through BIOS setup.

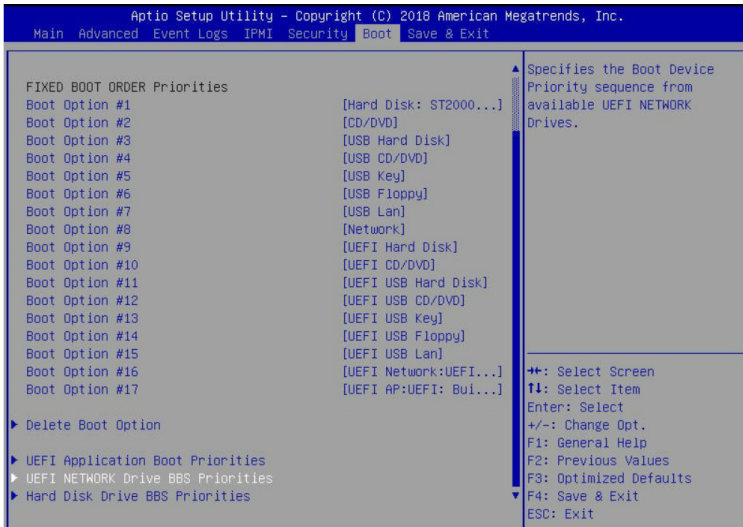
1. From the top of the tool bar, select Advanced to enter the submenu. Choose PCIe/PCI/PnP Configuration and press <Enter> to see the contents of PCI devices settings.



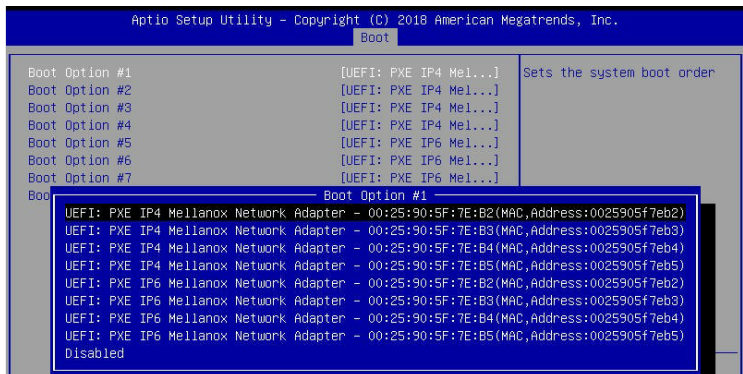
2. When the screen as shown below displays, use the arrow keys to select SIOM CPU1 PCI-E 3.0 x16 OPROM and press <Enter>. Use this feature to select which firmware type to be loaded for the add-on card in this slot. The options are Disabled, Legacy, and EFI. Select EFI and press <Enter>. To save the setting, select Save Changes and Reset from the Save & Exit menu and press <Enter>.



- To see the available boot options of the UEFI Network Drive, select Boot to enter the submenu. When the following screen appears, use the arrow keys to select UEFI NETWORK Drive BBS Priorities and press <Enter>.



- To examine the details of each boot option, select the corresponding numbers of the desired boot options. For example, when Boot Option #1 is selected, the MAC address of the Boot Option #1 page will appear.



- After the system configuration is completed, select Save Changes and Reset from the Save & Exit menu and press <Enter> to save the changes made.

```

Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
Main Advanced Event Logs IPMI Security Boot Save & Exit

Save Options
Discard Changes and Exit
Save Changes and Reset
Save Changes
Discard Changes

Default Options
Restore Optimized Defaults
Save as User Defaults
Restore User Defaults

Boot Override
ISATA P6: ST2000NX0253
UEFI: PXE IP4 Mellanox Network Adapter - 00:25:90:5F:7E:B2
UEFI: PXE IP4 Mellanox Network Adapter - 00:25:90:5F:7E:B3
UEFI: PXE IP4 Mellanox Network Adapter - 00:25:90:5F:7E:B4
UEFI: PXE IP4 Mellanox Network Adapter - 00:25:90:5F:7E:B5
UEFI: PXE IP6 Mellanox Network Adapter - 00:25:90:5F:7E:B2
UEFI: PXE IP6 Mellanox Network Adapter - 00:25:90:5F:7E:B3
UEFI: PXE IP6 Mellanox Network Adapter - 00:25:90:5F:7E:B4
UEFI: PXE IP6 Mellanox Network Adapter - 00:25:90:5F:7E:B5
UEFI: Built-in EFI Shell

Reset the system after
saving the changes.

+-: Select Screen
T1: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
    
```



**Note:** All screenshots shown are for illustration purpose only and may not match the screens that you see on your system.