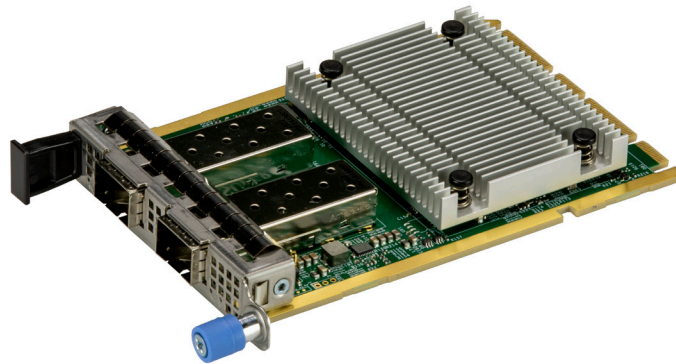
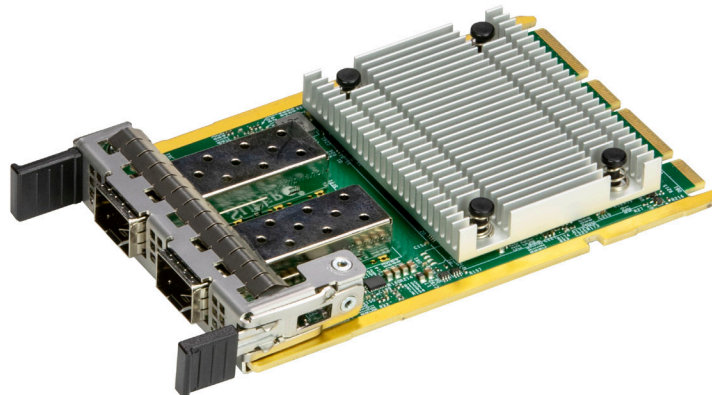




AOC-A25G-i2SM



AOC-A25G-i2SG



USER'S MANUAL

Revision 1.1

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Manual Revision 1.1

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Preface

About This Manual

This user's guide is written for system integrators, IT technicians, and knowledgeable end users. It provides information for the installation and use of the AOC-A25G-i2SM and AOC-A25G-i2SG add-on cards.

About This Add-On Card

Supermicro® Advanced I/O Modules (AIOM) are the latest form factor designed to provide a wide range of networking options as well as other I/O technologies. The AOC-A25G-i2SM/G is one of the most feature-rich and low-power consumption 25 GbE controllers in the market. Based on the Intel® E810-XXVAM2 Ethernet controller with features such as VXLAN, NVGRE, and RDMA, it provides unparalleled density, performance, and functionality. The Supermicro AOC-A25G-i2SM/G is the most versatile 25 GbE controller in the market with the best total cost of ownership for 25 GbE deployments in cloud, telecommunications, and enterprise data centers.

An Important Note to the User

All graphic images and layout drawings shown in this user's guide are based upon the latest PCB revision available at the time of publishing this user's guide. The add-on 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 to the manufacturer, the RMA number should be prominently displayed on the outside of the shipping carton and 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, RMA authorizations may be requested online (<http://www.supermicro.com/support/rma/>).

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

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

Conventions Used in the Manual

Special attention should be given to the following symbols for proper installation and to prevent damage done to the components or injury.



Warning! Indicates important information given to prevent equipment/property damage or personal injury.



Warning! Indicates high voltage may be encountered while performing a procedure.



Important: Important information given to ensure proper system installation or to relay safety precautions.



Note: Additional information given to differentiate various models or to provide information for proper system setup.

Important Links

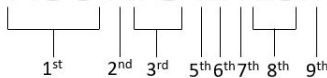
For your system to work properly, follow the links to download all necessary drivers/utilities and the user's manual for your server.

- Supermicro product manuals: <http://www.supermicro.com/support/manuals/>
- Product drivers and utilities: <https://www.supermicro.com/wdl/driver>
- Product safety info: http://www.supermicro.com/about/policies/safety_information.cfm
- A secure data deletion tool designed to fully erase all data from storage devices can be found at our website: https://www.supermicro.com/about/policies/disclaimer.cfm?url=/wdl/utility/Lot9_Secure_Data_Deletion_Utility/
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This manual may be periodically updated without notice. Check the Supermicro website for possible updates to the manual revision level.

Naming Convention

AOC-ATG-i2T2SM



Character	Representation	Options
1st	Product Family	AOC: Add On Card
2nd	Form Factor	S: Standard, P: Proprietary, C: MicroLP, M: Super IO Module (SIOM), MH: SIOM Hybrid A: Advanced IO Module (AIOM), AH: AIOM Hybrid
3rd	Product Type/Speed	G: GbE (1Gb/s), TG: 10GbE (10Gb/s), 25G: 25GbE (25Gb/s), 40G: 40GbE (40Gb/s), 50G: 50GbE (50Gb/s), 100G: 100GbE (100Gb/s), IBE: EDR IB (100Gb/s), HFI: Host Fabric Interface
4th	Chipset Model (Optional)	N: Niantec (82599), P: Powerville (i350), S: Sageville (X550), F: Fortville (XL710/X710), L: Lewisburg (PCH)
5th	Chipset Manufacturer	i: Intel, m: Mellanox, b: Broadcom
6th	Number of Ports	1: 1 port, 2: 2 ports, 4: 4 ports, 8: 8 ports
7th	Connector Type (Optional)	S: SFP/SFP+/SFP28, T: 10GBase-T, Q: QSFP+, C: QSFP28
8th	2 nd Controller/Connector Type (Optional)	G: 1x GbE RJ45, 2G: GbE 2x RJ45, S: 1x 10G SFP+, T: 10GBase-T, 2T: 2x 10GBase-T, 2S: 2x SFP+
9th	Bracket	For SIOM – Non-M: swappable bracket for Storage systems, M: Internal bracket for Twin systems. For AIOM – Non-M: 1U height bracket for Edge systems, M: 0.5U height bracket for all other systems.

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Chapter 1

Introduction

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 of quality and performance. For product support and updates, refer to our website at <https://www.supermicro.com/en/products/networking/adapters>.

1.2 Key Features

The key features of this add-on card include the following:

- Advanced I/O Module (AIOM) form factor
- Intel E810-XXVAM2 25 GbE controller
- Support for 25 GbE and 10 GbE speeds
- Dual SFP28 connectors
- PCIe Gen 4.0 x8 (backward compatible with PCIe 3.0)
- Low Latency RDMA over Converged Ethernet (iWARP and RoCE v2)
- Intel Ethernet Adaptive Virtual Function (Intel Ethernet AVF)
- Intel Ethernet Flow Director — Application Device Queues (ADQ)
- Data plan development kit
- Dynamic Device Personalization (DDP)
- Hardware Root of Trust (RoT) with firmware recovery
- VXLAN, NVGRE, and Geneve
- Asset Management Features with thermal sensor
- Network Controller Sideband Interface (NC-SI) for remote management

1.3 Specifications

General

- Advanced I/O Module (AIOM) form factor
- Intel E810-XXVAM2 25 GbE controller
- Dual SFP28 port
- Advance Device Queues (ADQ)
- Dynamic Device Personalization (DDP)

Converged Storage Network

- iSCSI
- SMB Direct
- iSER
- NVMe over RDMA (iWARP and RoCEv2)
- Storage Performance Development Kit (SPDK)
- NVMe over TCP

Virtualization Features

- VXLAN
- NVGRE
- Geneve
- SR-IOV
- 768 Virtual Station Interface (VSI)
- Eight Physical Functions (PF)
- Microsoft VM Queue
- VMWare NetQueue

- DPDK support
- QoS: Priority-based Flow Control (802.1Qbb)
- Enhanced Transmission Selection (802.1Qaz)

RDMA

- iWARP
- RoCEv2
- Data Center Bridging

Management and Control

- Network Controller Sideband Interface (NC-SI)
- BMC
- PLDM and PLDM-based firmware update

Remote Boot

- Signed UEFI option ROM compatible with HTTPS boot
- Remote boot over iSCSI
- PXE boot/UEFI PXE Boot

Precision Clocks Synchronization IEEE 802.3ae 10 Gigabit Ethernet

- IEEE 1588 (also known as the Precision Time Protocol (PTP))

Power Consumption

- ACPI Compliant power management
- Pass through Energy Efficient Ethernet (IEEE802.3az-2010)
- Maximum: 12.5 W

Operating Conditions

- Storage Temperature: -40°C to 115°C (-40°F to 239°F)

Physical Dimensions

- Card PCB dimensions: 2.99" x 4.52756" (76 mm x 115 mm) (W x D)

1.4 Available SKUs



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

SKUs	Bracket Included	Description
AOC-A25G-i2SM	BKT-0166L	2-port 25 Gigabit Ethernet Adapter with a 0.5U height bracket
AOC-A25G-i2SG	BKT-0209L	2-port 25 Gigabit Ethernet Adapter with a 0.5U height narrow bracket for Grand Twin Front IO systems

Chapter 2

Hardware Components

2.1 Add-On Card Image and Layout

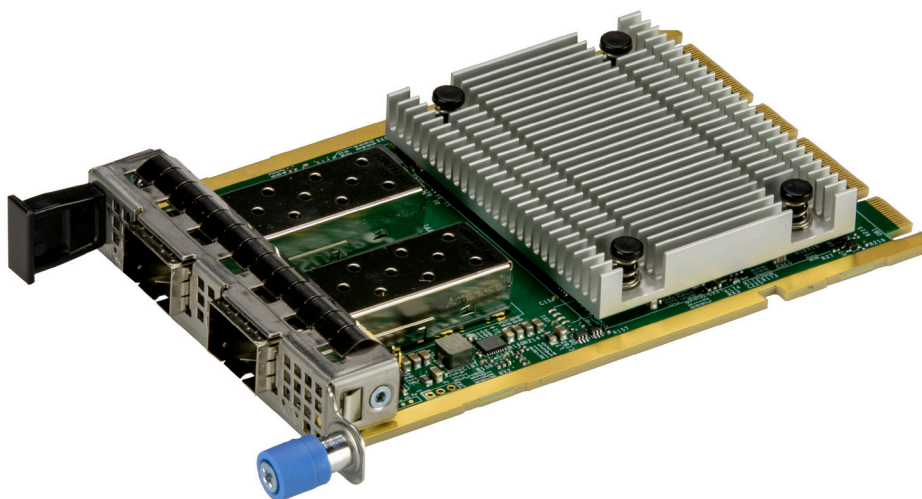


Figure 2-1: AOC-A25G-i2SM View

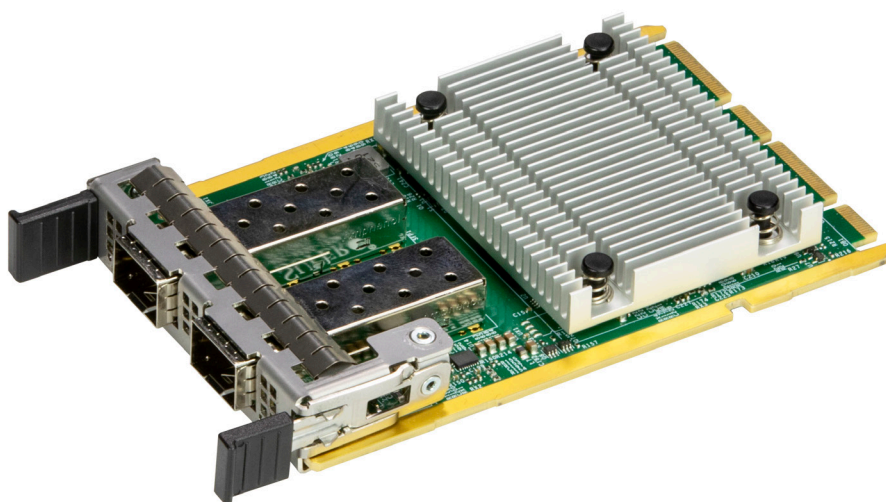


Figure 2-2: AOC-A25G-i2SG View

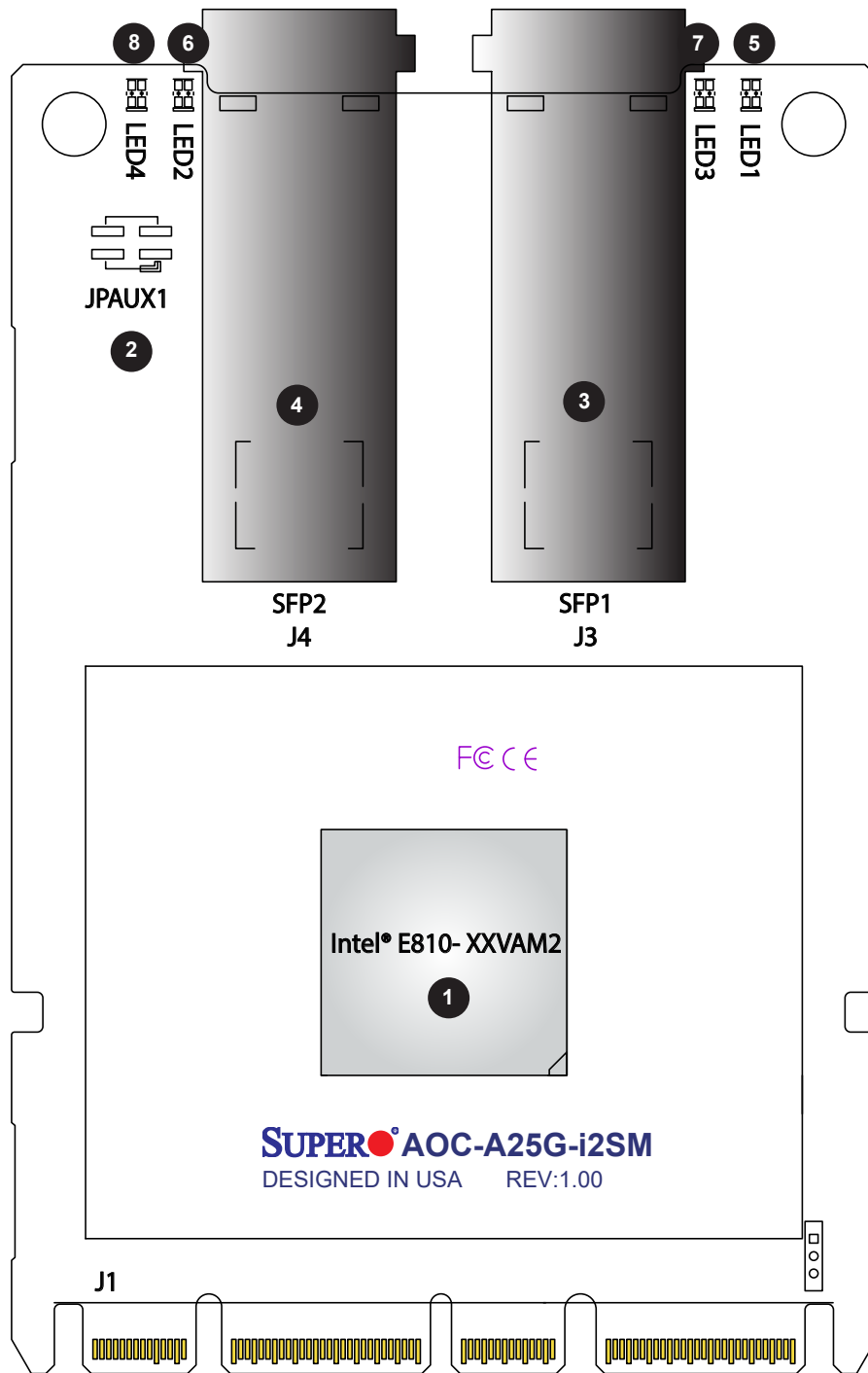


Figure 2-3: AOC-A25G-i2SM/G Layout

2.2 Major Components

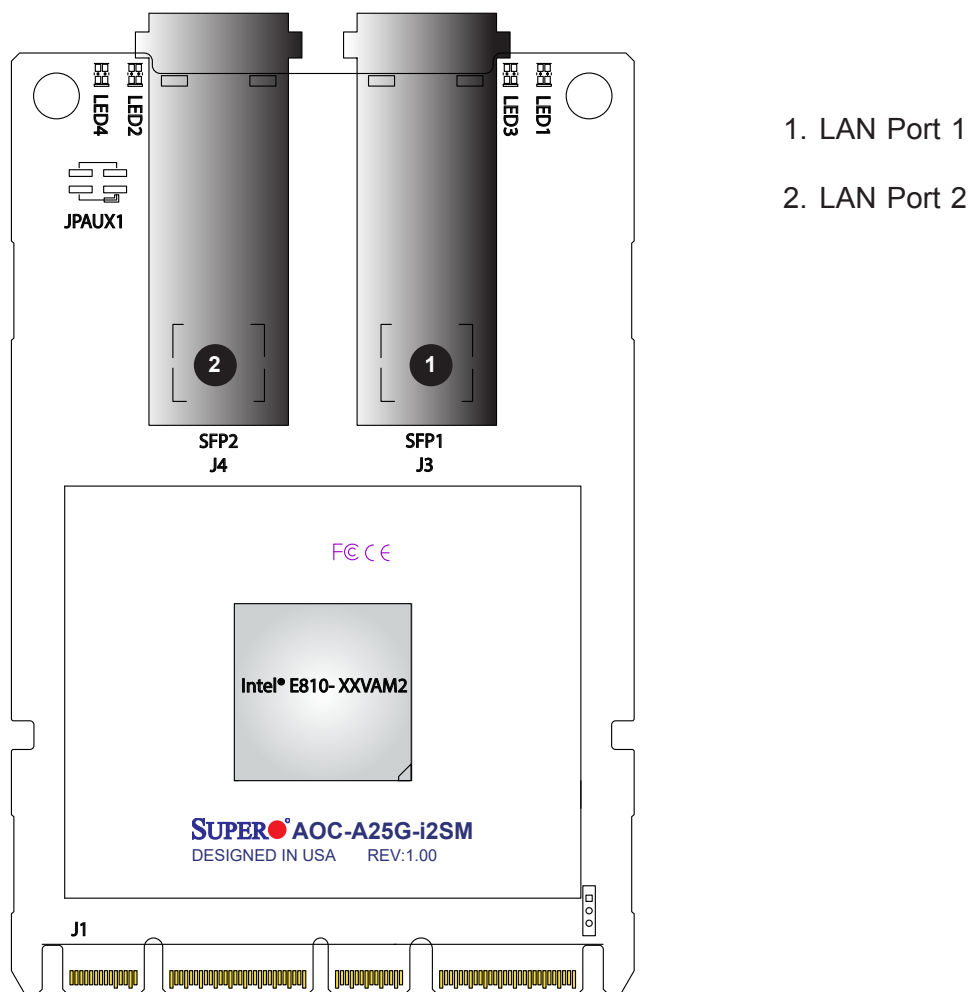
The following major components are installed on the AOC-A25G-i2SM/G:

AOC-A25G-i2SM/G Major Components		
No	Component Name	Definition
1	Intel E810-XXVAM2	Ethernet LAN controllers
2	JPAUX1	1–2: Enable AUX Power
		3–4: Disable AUX Power (default)
3	J3	SFP28 Port 1
4	J4	SFP28 Port 2
5	LED1	Port 1 Link LED
6	LED2	Port 2 Link LED
7	LED3	Port 1 Activity LED
8	LED4	Port 2 Activity LED

2.3 SFP28 Ethernet Connections

SFP28 Ethernet Connectors

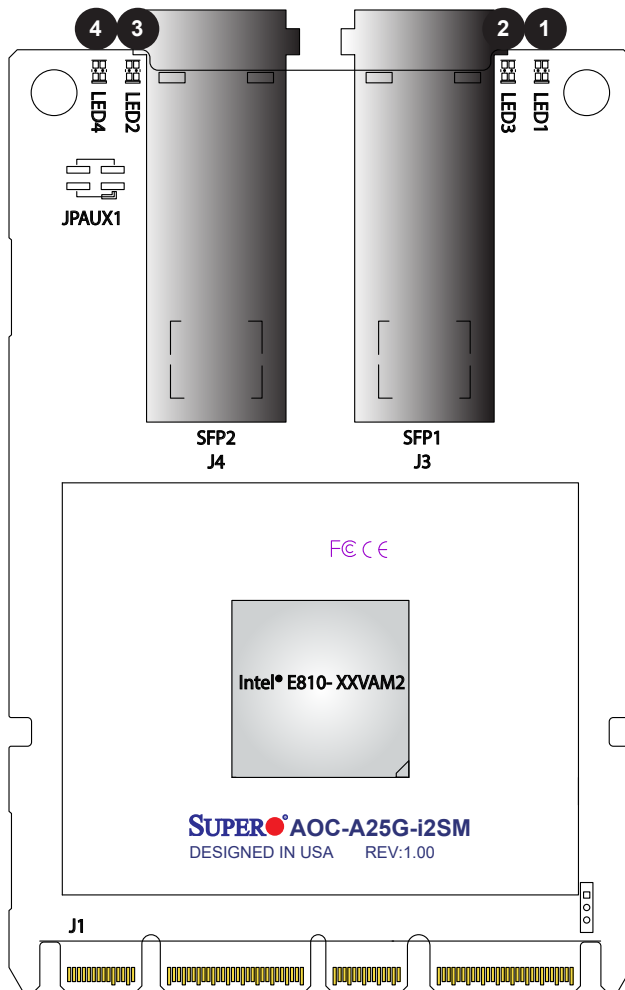
There is a total of two SFP28 LAN ports on the AOC-A25G-i2SM/G card. LAN Port 1 is located at J3 (SFP1), while LAN Port 2 is located at J4 (SFP2). These two LAN ports support network speeds of up to 25 GbE.



LAN LED Indicators

On this card, each SFP28 25 GbE LAN connector has two LEDs. This card's 25 GbE LAN has two bi-colored LED indicators per port (Link and Activity) at the bottom of the PCB. The LED on the left indicates link speeds, and the LED on the right indicates the status of the activity of the connector. Refer to the table for LED color definitions.

SFP28 Port LEDs		
LED	Color	Definition
Activity	Blink	Activity
Link	Green	25 Gbps
	Amber	10 Gbps



1. Port 1 Link LED
2. Port 1 Activity LED
3. Port 2 Link LED
4. Port 2 Activity LED

2.4 Jumper Settings

Explanation of Jumpers

To modify the operation of the motherboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board.

AOC JPAUX1 set to Disabled	When system/MB goes into standby mode		
	IPMI Support	FailOver Support	WoL Support
	No	No	No
	When system/MB is NOT in standby mode		
	IPMI Support	FailOver Support	WoL Support
	Yes	Yes	N/A
AOC JPAUX1 set to Enabled	When system/MB goes into standby mode		
	IPMI Support	FailOver Support	WoL Support
	Yes	Yes	Yes
	When system/MB is NOT in standby mode		
	IPMI Support	FailOver Support	WoL Support
	Yes	Yes	N/A

JPAUX1 for Standby Power	Function	Notes
Disable <i>No standby power to AOC NIC</i>	Disable jumper to disconnect the standby power	Default
Enable <i>Standby power to AOC NIC</i>	Enable jumper to connect the standby power to AOC NIC	WoL is supported on port 1 ONLY but limited to platforms with sufficient airflow when it is in standby mode (S5 state). Consult Supermicro before enabling it.

Chapter 3

Installation

Your system came with the AOC-A25G-i2SM/G add-on card to be used as a part of an integrated solution. We do not recommend that any part of your system components be removed and reinstalled. However, if you do need to remove or reinstall a system component, including this add-on card, follow the instructions to ensure proper system setup. Also, be sure to remove the power cord first before adding, removing, or changing any hardware components to avoid damaging the system or components.

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 or peripheral chips.
- 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

To install the add-on card properly, be sure to follow the instructions:

1. Power down the system.
2. Remove the power cord from the wall socket.
3. Use industry-standard antistatic equipment (such as gloves or a wrist strap) and follow the instructions listed on [page 17](#) to avoid damage caused by ESD.
4. Familiarize yourself with the server, motherboard, and/or chassis documentation.
5. Confirm that your operating system includes the latest updates and hot fixes.

3.3 Installing the Add-on Card (with 0.5U Bracket)

Follow the steps to install an add-on card into your system. (If the system is fixed onto a rack, the removal of the server top cover is not required. If the system is not anchored to a fixed structure, it is recommended to remove the system top cover for ease of installation.)

A. Uninstalling an AIOM Module

1. Unscrew the blue knob from the system.
2. Pull on the tab and the knob evenly on both sides of the card to disengage the AIOM module from the motherboard connector.
3. Gently slide the AIOM module out.

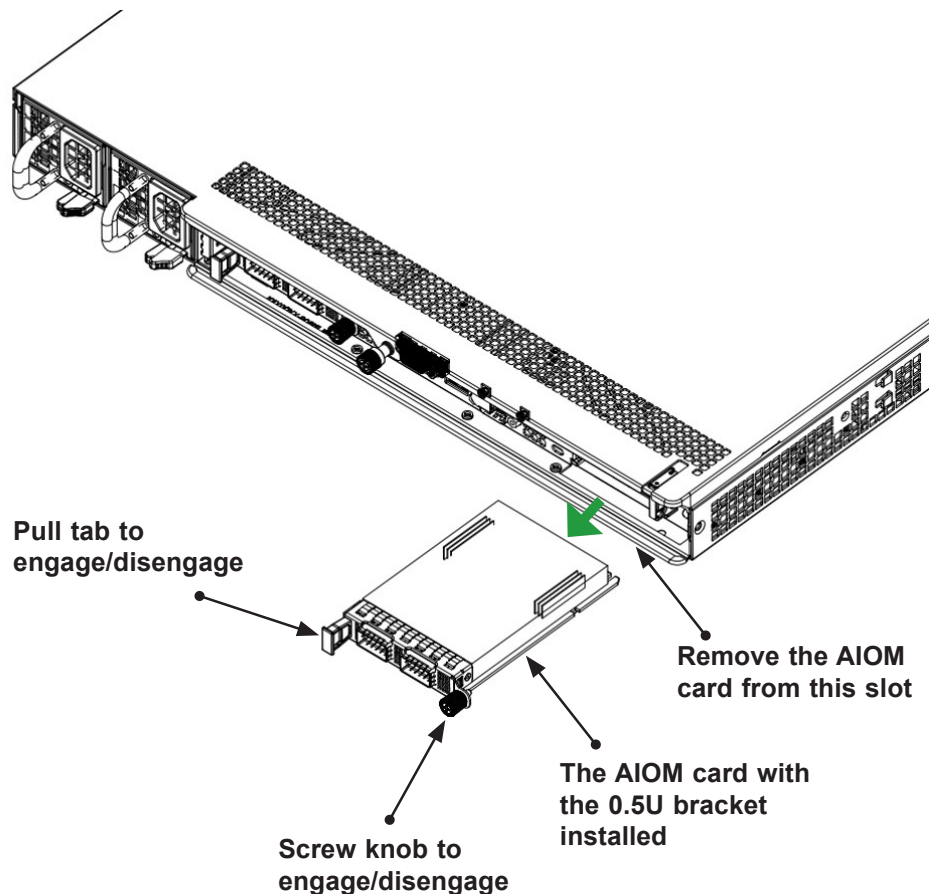


Figure 3-1: Uninstalling an AIOM Module

B. Installing an AIOM Module

1. Position the AIOM module in front of the empty slot.
2. Gently push it onto the metal bracket. The AIOM module should slide into the chassis until the card is securely seated in the connector.
3. Press the blue knob.
4. Secure it onto the chassis by turning the knob clockwise.

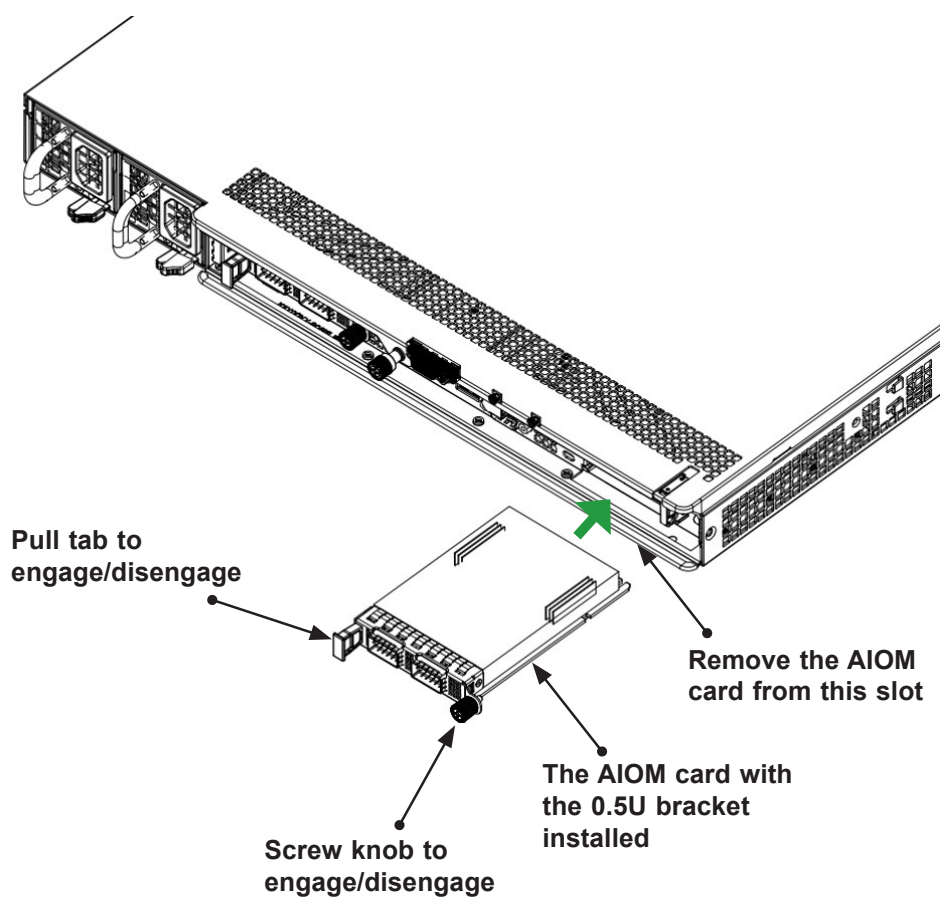


Figure 3-2: Installing an AIOM Module

C. Installing an AIOM Module (With a Slot Cover)

1. Remove the AIOM slot cover by unscrewing the knob and screw that attaches the bracket to the chassis.
2. Pull the bracket away and set it aside.
3. Position the AIOM module in front of the empty slot and gently push it onto the metal bracket. The AIOM module should slide into the chassis until the card is securely seated in the connector.
4. Press the blue knob.
5. Secure it onto the chassis by turning the knob clockwise.

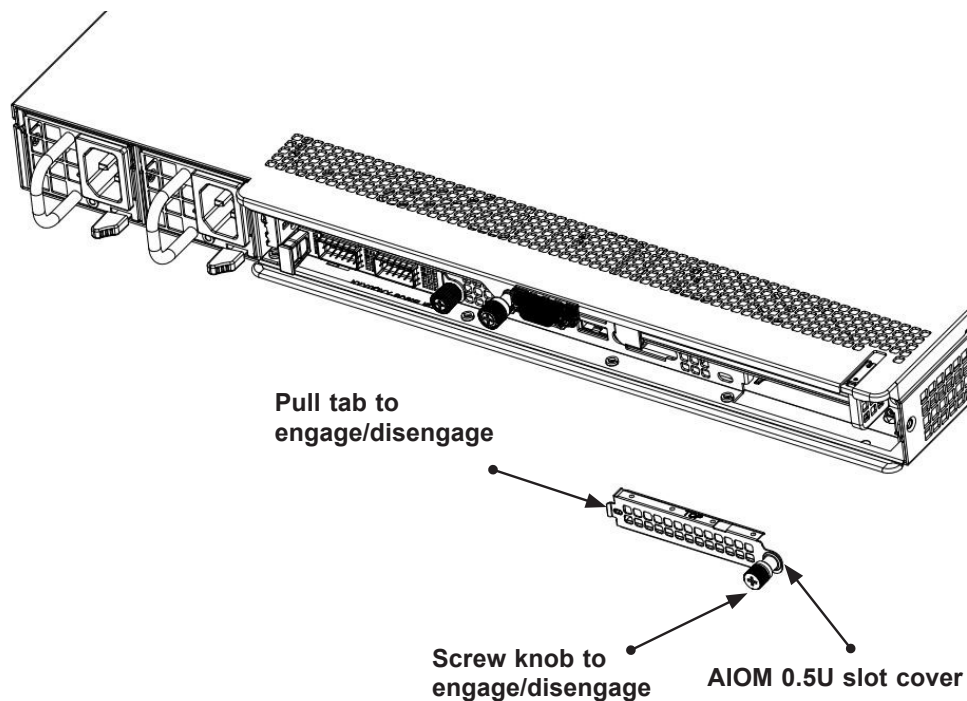



Figure 3-3: Installing an AIOM Module with Slot Cover

 **Note 1:** This AIOM module does not support the hot plug. Turn off the AC power and remove the power cord from the wall socket before installing or removing an AIOM module.

Note 2: Graphics shown above are for illustration purposes only. Actual products may vary due to product enhancement.

3.4 Installing the Drivers on Windows (for Intel E810-XXVAM2)

Follow the steps to install the drivers for Windows. Download the drivers from the Supermicro FTP site at ftp://ftp.supermicro.com/Networking_Drivers/.

1. Run CDR-NIC.
2. When the SUPERMICRO window appears, click on the computer icon next to the product model.

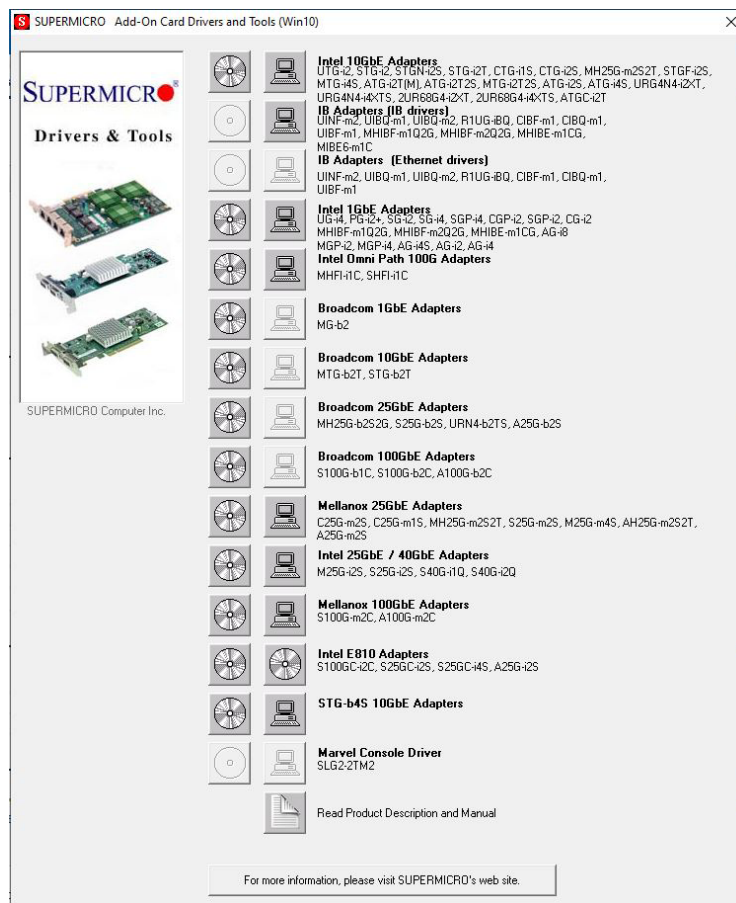


Figure 3-4: Add-On Card Drivers and Tools

 **Note:** If the *FOUND NEW HARDWARE WIZARD* screen displays on your system, click CANCEL.

3. Click on INSTALL DRIVERS AND SOFTWARE.
4. Follow the prompts to complete the installation.

3.5 Installing the Drivers

Download the drivers from Intel Download Center or the Supermicro site at https://www.supermicro.com/wftp/Networking_Drivers.

Build a Binary RPM Package

Follow the steps to build a binary RPM package for this driver:



Note: RPM functionality has only been tested in Red Hat distributions.

1. Run the following command, where <x.x.x> is the version number for the driver tar file:

```
# rpmbuild -tb ice-<x.x.x>.tar.gz
```



Note: For the build to work properly, the kernel currently running **MUST** match the version and configuration of the installed kernel sources. If you have just recompiled the kernel, reboot the system before building.

2. After building the RPM, the last few lines of the tool output contain the location of the RPM file that was built. Install the RPM with one of the following commands, where <RPM> is the location of the RPM file:

```
# rpm -Uvh <RPM>
```

or

```
# dnf/yum localinstall <RPM>
```



Note 1: To compile the driver on some kernel/arch combinations, you may need to install a package with the development version of libelf (e.g., libelf-dev, libelf-devel, elfutils-libelf-devel).

Note 2: When compiling an out-of-tree driver, users will find that details may vary by distribution. However, you will usually need a kernel-devel RPM or some RPM that provides the kernel headers at a minimum. The RPM kernel-devel will usually fill in the link at `/lib/modules/'uname -r'/build`.

Manually Building the Driver

Follow the steps to manually build the driver:

1. Move the base driver tar file to the directory of your choice. For example, use '/home/username/ice' or '/usr/local/src/ice'.
2. Untar/unzip the archive where <x.x.x> is the version number for the driver tar file:

```
# tar xzf ice-<x.x.x>.tar.gz
```

3. Change to the driver src directory where <x.x.x> is the version number for the driver tar:

```
# cd ice-<x.x.x>/src
```

4. Compile the driver module:

```
# make install
```

The binary will be installed as:

```
/lib/modules/<KERNEL VER>/updates/drivers/net/ethernet/intelice/  
ice.ko
```

The installation location listed above is the default location. This may differ for various Linux distributions.



Note: To compile the driver with Application Device Queues (ADQ) flags set, use the following command where <nproc> is the number of logical cores:

```
# make -j<nproc> CFLAGS_EXTRA='-DADQ_PERF -DADQ_PERF_COUNTERS' in-  
stall
```

This will also apply the above 'make install' command.

5. Load the module using the modprobe command. To check the version of the driver and then load it, enter the following commands:

```
# modinfo ice
```

```
# modprobe ice
```

Alternately, make sure that any older ice drivers are removed from the kernel before loading the new module:

```
# rmmmod ice; modprobe ice
```



Note: To enable verbose debug messages in the kernel log, use the dynamic debug feature (dyndbg). See "Dynamic Debug" later in this README for more information.

6. Assign an IP address to the interface by entering the following, where <ethX> is the interface name that was shown in dmesg after modprobe:

```
# ip address add <IP_address>/<netmask bits> dev <ethX>
```

7. After verifying that the interface works, enter the following commands where the IP_ address is for another machine on the same subnet. Do so when the interface is being tested:

```
# ping <IP_address>
```

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