

AOC-A25G-i4SM



AOC-A25G-i4SG



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-A25G-i4SM and AOC-A25G-i4SG add-on card.

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 Supermicro[®] AOC-A25G-i4SM and AOC-A25G-i4SG are some of the most featurerich and low power consumption 25GbE controllers in the market. Based on the Intel[®] Columbiaville E810-CAM1 Ethernet controller with features such as VxLAN, NVGRE, RDMA, and others, they provide unparalleled density, performance, and functionality. These controllers are the most versatile and have the best total cost of ownership for 25GbE deployments in cloud, telco, and enterprise data centers.

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 addon 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 an RMA authorization online <u>http://www.supermicro.com/RmaForm/</u>.

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 for safety instructions to prevent damage to the system or injury to yourself:



Warning: Important information given to ensure proper system installation or to prevent damage to the components or injury to yourself.

/ I

Note: Additional information given for proper system setup.

Naming Convention for Standard Network Adapters

1 st 2 ^{no} 3 ^{ra} 5 th 6 th 7 th 8 th 9 th				
Character	Representation	Options		
1st	Product Family	AOC: Add On Card		
2nd	Form Factor	S: Standard, P: Proprietary, C: Microl <i>P</i> , 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, 5: 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.		



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Table of Contents

Preface

Chapter 1 Overview

1-1	Overview	1-1
1-2	Key Features	1-1
1-3	Technical Specifications	1-2
1-4	Available SKUs	
Cha	pter 2 Hardware Components	
2-1	Add-On Card Image and Layout	2-1
2-2	Major Components	
2-3	SFP28 Ethernet Connections	
2-4	Jumper Settings	
Cha	oter 3 Installation	
3-1	Static-Sensitive Devices	3-1
3-2	Before Installation	
3-3	Uninstalling and Installing the AOC-A25G-i4SM and AOC-A25G-i4SG	3-3
3-4	Installing Drivers (for Intel [®] Columbiaville E810-CAM1)	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

- Advanced I/O Module (AIOM) form factor
- Intel® Columbiaville E810-CAM1 25GbE controller
- Support for 25GbE and 10GbE speed
- Quad port SFP28 connectors
- PCIe Gen 4.0 (backward compatible to 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)
- 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 Technical Specifications

General

- Advanced I/O Module (AIOM) form factor
- Intel® E810-CAM1 25GbE controller
- Quad port SFP28 connectors
- 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

RDMA

- iWARP
- RoCEv2

Management and Control

- NC-SI over MCTP
- NC-SI over SMBus
- MCTP over PCIe
- BMC
- PLDM and PLDM based firmware update

Remote Boot

- Signed UEFI option ROM compatible with HTTPS 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: 14W

Operating Conditions

Storage Temperature: -40 °C to 115 °C

Physical Dimensions

• 76mm x 115mm (W x D)

1-4 Available SKUs

SKUs	Bracket Included	Description
AOC-A25G-i4SM	BKT-0159L	4-port 25 Gigabit Ethernet Adapter with a 0.5U height bracket
AOC-A25G-i4SG	BKT-0206L	4-port 25 Gigabit Ethernet Adapter with a 0.5U height Narrow bracket for Grand Twin Front IO systems.

Note: Please note that this product is sold only as part of an integrated solution with Supermicro server systems.

Chapter 2

Hardware Components

2-1 Add-On Card Image and Layout



AOC-A25G-i4SM View



AOC-A25G-i4SG View



AOC-A25G-i4SM Front Layout



AOC-A25G-i4SM Bottom Layout

2-2 Major Components

The following major components are installed on the AOC-A25G-i4SM and AOC-A25G-i4SG:

A	AOC-A25G-i4SM and AOC-A25G-i4SG Major Components			
No	Component Name	Definition		
1	Intel [®] E810-CAM1	Ethernet 25GbE LAN controller		
2	JPAUX1	1-2: Enable AUX Power		
		3-4: Disable AUX Power (default)		
3	SFP1	SFP28 Port 1		
4	SFP2	SFP28 Port 2		
5	SFP3	SFP28 Port 3		
6	SFP4	SFP28 Port 4		
7	D6	SFP28 LAN 4 Link LED		
8	D7	SFP28 LAN 4 Active LED		
9	D8	SFP28 LAN 3 Link LED		
10	D9	SFP28 LAN 3 Active LED		
11	D10	SFP28 LAN 2 Link LED		
12	D11	SFP28 LAN 2 Active LED		
13	D12	SFP28 LAN 1 Link LED		
14	D13	SFP28 LAN 1 Active LED		

2-3 SFP28 Ethernet Connections

SFP28 Ethernet Connectors

There are a total of four SFP28 LAN ports (SFP1/SFP2/SFP3/SFP4) on the AOC-A25G-i4SM and AOC-A25G-i4SG. These four LAN ports support network speeds of up to 25GbE.

Link/Activity LED Indicators

Each 25GbE LAN has two bi-colored LED indicators per port (Link and Activity) at the bottom of PCB. Please refer to the table below for LED color definition.

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



- 1. SFP28 Port 1
- 2. SFP28 Port 2
- 3. SFP28 Port 3
- 4. SFP28 Port 4

LAN LED

Each SFP28 connector has two LEDs. The LED on the left indicates link speed of the connector, and the LED on the right indicates the connector's activity status. See the table on the previous page for more information.



- 1. SFP28 Port 1 Link LED
- 2. SFP28 Port 1 Active LED
- 3. SFP28 Port 2 Link LED
- 4. SFP28 Port 2 Active LED
- 5. SFP28 Port 3 Link LED
- 6. SFP28 Port 3 Active LED
- 7. SFP28 Port 4 Link LED
- 8. SFP28 Port 4 Active 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.

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

JPAUX1 for Standby Power	Function	Notes
Disable = No standby power to AOC NIC	Disable jumper to disconnect the standby power	Default
Enable = Standby power to AOC NIC	Enable jumper to connect standby power to AOC NIC	WoL is supported on all four ports but limited to platforms with sufficient airflow when it is in standby mode (S5 state). Please consult Supermicro before enabling it.

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 that you are static protected.



3-2 Before Installation

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

- 1. Power down the system.
- 2. Unplug the power cord.
- Use industry-standard anti-static equipment such as gloves or a wrist strap. Follow the precautions on page 3-1 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 hotfixes.

3-3 Uninstalling and Installing the AOC-A25G-i4SM and AOC-A25G-i4SG

Follow the steps below to install an add-on card into your system. (If the system is fixed onto a rack, the removal of 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 knob evenly on both sides of the card to disengage the AIOM module from the motherboard connector.



B. Installing an AIOM Module

- 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.
- 2. Press the blue knob.
- 3. Secure the module onto the chassis by turning the knob clockwise.



C. Installing an AIOM Module (with an AIOM Slot Cover)

- 1. Remove the AIOM slot cover by removing the knob and screw that is attached to the bracket of the chassis.
- 2. Pull the bracket away and set it aside.
- 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 and secure it onto the chassis by turning the knob clockwise.



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

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

3-4 Installing Drivers (for Intel[®] Columbiaville E810-CAM1)

To install both drivers and firmware for the AOC-A25G-i4SM and AOC-A25G-i4SG add-on card for either Linux or Windows, please follow the instructions below.

SUPERMICRO Add-On Card Drivers and Tools (Win10)				×
SUPERMICR• Drivers & Tools			Intel 106/E Adopting UTG-2, STI-2, STG-2T, CTG-15, CTG-15, CTG-25, M1256 m2527, STG-27, UTG-24, STG-27, M12-72, M15-27, M12-72, M15-27, M12-72, M12	
and the second			Broadcom 1GbE Adapters MG-b2	
A State of the sta		₽	Broadcom 10GbE Adapters MTG-b2T, STG-b2T	
SUPERMICRO Computer Inc.			Broadcom 25GbE Adapters MH25G-b2S2G, S25G-b2S, URN4-b2TS, A25G-b2S	
		8	Broadcom 100GbE Adapters \$100G-b1C, \$100G-b2C, A100G-b2C	
		8	Mellanox 25GbE Adapters C25G-m25, C25G-m15, MH25G-m252T, 525G-m25, M25G-m45, AH25G-m252T, A25G-m25, 2UR6864-m215, URG4N4-m215	
		₽	Intel 25GbE / 40GbE Adapters M256425, S25G425, S40G410, S40G420	
		₽	Mellanox 100GbE Adapters S100G-m2C, A100G-m2C	
		۲	Intel E810 Adapters \$1006C42C, \$256C42S, \$256C44S, A25642S, A25644S	
	\odot	₽	STG-b4S 10GbE Adapters	
	\odot		Marvel Console Driver SLG2-2TM2	
			Read Product Description and Manual	

Building Driver RPM Package

Please follow the steps below 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.

 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 Driver

Please follow the steps below to manually build driver.

- 1. Move the base drive tar file to the directory of your choice. For example, use '/home/username/ice' or '/usr/local/src/ice'.
- Untar/unzip the archive where <x.x.x> is the version number for the driver tar file:
 - # tar zxf ice-<x.x.x>.tar.gz
- 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 ADQ (Application Device Queues) flags set, use the following command where <nproc> is the number of logical cores:

```
# make -j<nproc> CFLAGS_EXTRA='-DADQ_PERF -DADQ_PERF_COUN-
TERS' install
```

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:

rmmod 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.

 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>

(Disclaimer Continued)

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