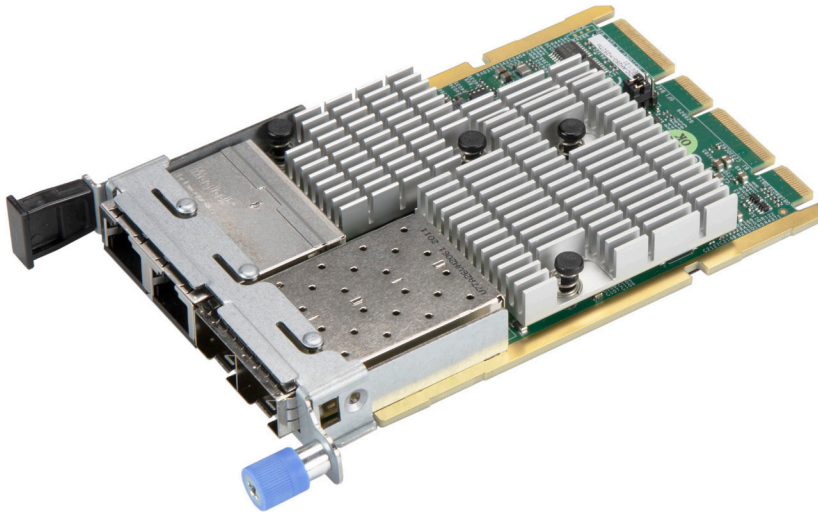
# AOC-AH25G-m2S2TM



## User's Guide

Revision 1.0

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User's Guide Revision 1.0

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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-AH25G-m2S2TM add-on card.

## About this Add-on Card

The Supermicro AOC-AH25G-m2S2TM is one of the most feature rich 25GbE controllers in the market. Based on the Mellanox® ConnectX-4 Lx EN with features such as VXLAN and NVGRE, it provides flexible connectivity for different networking platforms. It is compatible with 10GbE networks and offers the most cost effective upgrades from 10GbE to 25GbE for Data Center and Cloud deployments. The AOC-AH25G-m2S2TM also supports an additional 2-ports of 10GbE RJ45 connectivity, based on the Intel® X550 controller, providing NC-SI for Remote Management. this versatile 25GbE controller is an excellent choice to enhance data center network connectivity when high speed throughput is required.

## 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 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 the motherboard 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.

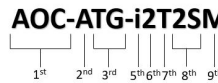
## Conventions Used in the User's Guide

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

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

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

## Naming Convention for Standard Network Adaptors




| Character | Representation | Options |
|---|---|---|
| 1st | Product Family | AOC: Add On Card |
| 2nd | Form Factor | S: Standard, P: Proprietary, C: MicroLP,<br>M: Super IO Module (SIOM), MH: SIOM Hybrid<br>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),<br>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 | 2nd 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.<br>For AIOM – Non-M: 1U height bracket for Edge systems, M: 0.5U height bracket for all other systems. |

## Networking Adapter List

| Model | Type | Form Factor | Controller | Connection | Dimension (w/o Brackets) (L x H) | Power (W) |
|---|---|---|---|---|---|---|
| AOC-MGP-i2 | GbE | SIOM | Intel® i350 AM2 | 2 RJ45 (1Gb/port) | 3.622" (92mm) x 3.428" (87.08mm) | 3.7 |
| AOC-MGP-i4 | GbE | SIOM | Intel® i350 AM4 | 4 RJ45 (1Gb/port) | 3.622" (92mm) x 3.428" (87.08mm) | 4.4 |
| AOC-MTGN-i2S | 10GbE | SIOM | Intel® 82599ES | 2 SFP+ (10Gb/port) | 3.622" (92mm) x 3.428" (87.08mm) | 7.2 |
| AOC-MTG-i4S | 10GbE | SIOM | Intel® XL710-BM1 | 4 SFP+ (10Gb/port) | 3.622" (92mm) x 3.428" (87.08mm) | 7 |
| AOC-MTG-b2T | 10GbE | SIOM | Broadcom® BCM57416 | 2 RJ45 (10GBase-T) | 3.622" (92mm) x 3.428" (87.08mm) | 11 |
| AOC-MTG-i2T | 10GbE | SIOM | Intel® X550-AT2 | 2 RJ45 (10GBase-T) | 3.622" (92mm) x 3.428" (87.08mm) | 13 |
| AOC-MTG-i4T | 10GbE | SIOM | 2x Intel® X550-AT2 | 4 RJ45 (10GBase-T) | 3.622" (92mm) x 3.428" (87.08mm) | 26 |
| AOC-MHIBF-m1Q2G | FDR IB GbE | SIOM | Mellanox® ConnectX-3 Pro Intel® i350 | 1 QSFP (56Gb/port) 2 RJ45 (1Gb/port) | 3.622" (92mm) x 3.428" (87.08mm) | 9 |
| AOC-MHIBF-m2Q2G | FDR IB GbE | SIOM | Mellanox® ConnectX-3 Pro Intel® i350 | 2 QSFP (56Gb/port) 2 RJ45 (1Gb/port) | 3.622" (92mm) x 3.428" (87.08mm) | 11 |
| AOC-MHIBE-m1CG | EDR IB GbE | SIOM | Mellanox® ConnectX-4 VPI Intel® i210 | 1 QSFP28 (100Gb/port) 1 RJ45 (1Gb/port) | 3.622" (92mm) x 3.428" (87.08mm) | 19 |
| AOC-MH25G-b2S2G | 25GbE | SIOM | Broadcom® BCM57414 Intel® i350 | 2 SFP28 (25Gb/port) 2 RJ45 (1Gb/port) | 3.622" (92mm) x 3.428" (87.08mm) | 9 |
| AOC-MH25G-m2S2T | 25GbE | SIOM | Mellanox® ConnectX-4 Lx EN Intel® X550-AT2 | 2 SFP28 (25Gb/port) 2 RJ45 (10GBase-T) | 3.622" (92mm) x 3.428" (87.08mm) | 25 |
| AOC-M25G-m4S | 25GbE | SIOM | Mellanox® ConnectX-4 Lx EN | 4 SFP28 (25Gb/port) | 3.622" (92mm) x 3.428" (87.08mm) | 20 |
| AOC-M25G-i2S | 25GbE | SIOM | Intel® XXV710 | 2 SFP28 (25Gb/port) | 3.622" (92mm) x 3.428" (87.08mm) | 11.8 |
| AOC-MHFI-i1C | Omni-Path | SIOM | Intel® OP HFI ASIC (Wolf River WFR-B) | 1 QSFP28 (100Gb/port) | 3.622" (92mm) x 3.428" (87.08mm) | 15 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| AOC-SGP-i2 | GbE | Standard LP | PCI-E x4 | Intel® i350 AM2 | 2 RJ45 (1Gb/port) | 3.9" (99mm) x 2.73" (69mm) | 3.5 |
| AOC-SGP-i4 | GbE | Standard LP | PCI-E x4 | Intel® i350 AM4 | 4 RJ45 (1Gb/port) | 3.9" (99mm) x 2.73" (69mm) | 5 |
| AOC-STG-i2T | 10GbE | Standard LP | PCI-E x8 | Intel® X540-AT2 | 2 RJ45 (10GBase-T) | 5.9" (150mm) x 2.73" (69mm) | 13 |
| AOC-STGS-i1T | 10GbE | Standard LP | PCI-E x4 | Intel® X550-AT | 1 RJ45 (10GBase-T) | 5.9" (150mm) x 2.73" (69mm) | 9 |
| AOC-STGS-i2T | 10GbE | Standard LP | PCI-E x4 | Intel® X550-AT2 | 2 RJ45 (10GBase-T) | 5.9" (150mm) x 2.73" (69mm) | 11 |
| AOC-STG-b2T | 10GbE | Standard LP | PCI-E x8 | Broadcom® BCM57416 | 2 RJ45 (10GBase-T) | 5.6" (142mm) x 2.73"(69mm) | 13.1 |
| AOC-STG-i4T | 10GbE | Standard LP | PCI-E x8 | Intel® XL710-BM1 | 4 RJ45 (10GBase-T) | 5.9" (149mm) x 2.73"(69mm) | 15.5 |
| AOC-STGN-i1S | 10GbE | Standard LP | PCI-E x8 | Intel® 82599EN | 1 SFP+ (10Gb/port) | 4.0" (102mm) x 2.73" (69mm) | 10 |
| AOC-STGN-i2S | 10GbE | Standard LP | PCI-E x8 | Intel® 82599ES | 2 SFP+ (10Gb/port) | 4.0" (102mm) x 2.73" (69mm) | 11.2 |
| AOC-STGF-i2S | 10GbE | Standard LP | PCI-E x8 | Intel® X710-BM2 | 2 SFP+ (10Gb/port) | 5.19" (132mm) x 2.73" (69mm) | 5.6 |
| AOC-STG-b4S | 10GbE | Standard LP | PCI-E x8 | Broadcom® BCM57840S | 4 SFP+ (10Gb/port) | 5.4" (137mm) x 2.73" (69mm) | 14 |
| AOC-STG-i4S | 10GbE | Standard LP | PCI-E x8 | Intel® XL710-BM1 | 4 SFP+ (10Gb/port) | 5.9" (150mm) x 2.73" (69mm) | 8 |
| AOC-S25G-m2S | 25GbE | Standard LP | PCI-E x8 | Mellanox® CX-4 LX | 2 SFP28 (25Gb/port) | 5.6" (142mm) x 2.713" (69mm) | 8.7 |
| AOC-S25G-b2S | 25GbE | Standard LP | PCI-E x8 | Broadcom® BCM57414 | 2 SFP28 (25Gb/port) | 5.6" (142mm) x 2.713" (69mm) | 5.2 |
| AOC-S25G-i2S | 25GbE | Standard LP | PCI-E x8 | Intel® XXV710 | 2 SFP28 (25Gb/port) | 6.1" (155mm) x 2.713" (69mm) | 7.2 |
| AOC-S40G-i1Q | 40GbE | Standard LP | PCI-E x8 | Intel® XL710-BM1 | 1 QSFP+ (40Gb/port) | 5.9" (150mm) x 2.73" (69mm) | 6.5 |
| AOC-S40G-i2Q | 40GbE | Standard LP | PCI-E x8 | Intel® XL710-BM2 | 2 QSFP+ (40Gb/port) | 5.9" (150mm) x 2.73" (69mm) | 7 |
| AOC-S100G-m2C | 100GbE | Standard LP | PCI-E x16 | Mellanox® CX-4 EN | 2 QSFP28 (100Gb/port) | 6.6" (168mm) x 2.73" (69mm) | 16.3 |
| AOC-S100G-b1C | 100GbE | Standard LP | PCI-E x16 | Broadcom® BCM57454 | 2 QSFP28 (100Gb/port) | 6.6" (168mm) x 2.73" (69mm) | 17.8 |
| AOC-CGP-i2 | GbE | MicroLP | PCI-E x4 | Intel® i350 AM2 | 2 RJ45 (1Gb/port) | 4.45" (113mm) x 1.54" (39mm) | 4 |
| AOC-CTG-i1S | 10GbE | MicroLP | PCI-E x8 | Intel® 82599EN | 1 SFP+ (10Gb/port) | 4.85" (123mm) x 1.54" (39mm) | 10 |
| AOC-CTG-i2S | 10GbE | MicroLP | PCI-E x8 | Intel® 82599ES | 2 SFP+ (10Gb/port) | 4.85" (123mm) x 1.54" (39mm) | 11 |
| AOC-CTG-i2T | 10GbE | MicroLP | PCI-E x8 | Intel® X540-AT2 | 2 RJ45 (10GBase-T) | 4.8" (123mm) x 2.75" (77mm) | 13 |
| AOC-CTGS-i2T | 10GbE | MicroLP | PCI-E x4 | Intel® X550-AT2 | 2 RJ45 (10GBase-T) | 4.45" (113mm) x 1.54" (39mm) | 12 |
| AOC-C25G-m1S | 25GbE | MicroLP | PCI-E x8 | Mellanox® CX-4 Lx EN | 1 SFP28 (28Gb/port) | 4.45" (113mm) x 1.54" (39mm) | 8.5 |

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# 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

- Advance I/O Module (AIOM) form factor
- Mellanox® ConnectX-4 Lx EN 25GbE controller, dual SFP28 (Small Form Factor Pluggable) connectors
- Intel® X550-AT2 10GbE controller, dual RJ45 connectors
- Hardware offloads for NVGRE, VXLAN, and GENEVE encapsulated traffic
- SR-IOV for virtualization
- Low latency RDMA over Converged Ethernet (RoCE) (25GbE controller only)
- Jumbo frames support
- NC-SI for Remote Management (10GbE controller only)
- BMC Thermal reading support
- RoHS compliant 6/6

## 1-3 Specifications

### General

- Advanced I/O Module (AIOM) form factor
- Mellanox® ConnectX-4 Lx EN 25GbE controller
  - Dual SFP28 connectors with speed up to 25Gbps per port
- Intel® X550-AT2 10GbE 10GBase-T controller
  - Dual RJ45 connectors with speed up to 10Gbps per port

### Cables Support

- 25GbE SFP28: Direct-attached copper cables and fiber-optic cables (with required optional transceivers)
- 10GbE RJ45: RJ-45 Category-6 up to 55m; Category-6A up to 100m

### Power Consumption

- Maximum power consumption: 25W

### Operating Condition

- Storage condition: -40°C to 70°C (-40°F to 158°F)
- Storage humidity: 90% non-condensing relative humidity at 35°C

### Physical Dimensions

- Card PCB dimensions: 115mm (4.528in) x 76mm (2.992in) (WxD)



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

## 25GbE SFP28 Specifications

### Networking Features

- 25GbE/10GbE/1GbE
- IEEE 802.3ad, 802.1AX Link Aggregation
- IEEE 802.1Q, 802.1P VLAN tags and priority
- IEEE 1588v2
- Jumbo frame support (9.6KB)

### 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

- RAID offload – erasure coding (Reed-Solomon) offload

### Overlay Networks

- 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

### OS Support

- RHEL/CentOS
- Windows
- FreeBSD

- VMware

## 10GbE RJ45 Specifications

### I/O Features

- MXI-X Support
- Intel® Flow Director
- Low latency
- Multiple Queues – 64 Tx and Rx per port
- Tx/Rx IP, SCTP, TCP, and UDP Checksum Offloading (IPv4, IPv6) capabilities
- Tx TCP Segmentation Offload (IPv4, IPv6)

### Network Features

- Jumbo frames up to 15.5KB
- IEEE 802.3az Energy Efficient Ethernet (EEE)

### Virtualization Features

- Multi-mode I/O Virtualization Operations
- VXLAN Stateless Offloads
- NVGRE Stateless Offloads
- Virtual Machine Device Queues (VMDq)
- 64 Transmit (Tx) and Receive (Rx) Queue Pairs per port
- FPP – 64 VFs per port
- Support for PCI-SIG SR-IOV Specification
- IEEE 802.1Q VLAN Support

### Management Features

- Preboot eXecution Environment (PXE) support
- iSCSI Remote Boot Support and FCoE
- NC-SI for remote management

### OS Support

- Linux RHEL, Linux SLES
- Windows
- FreeBSD
- VMware

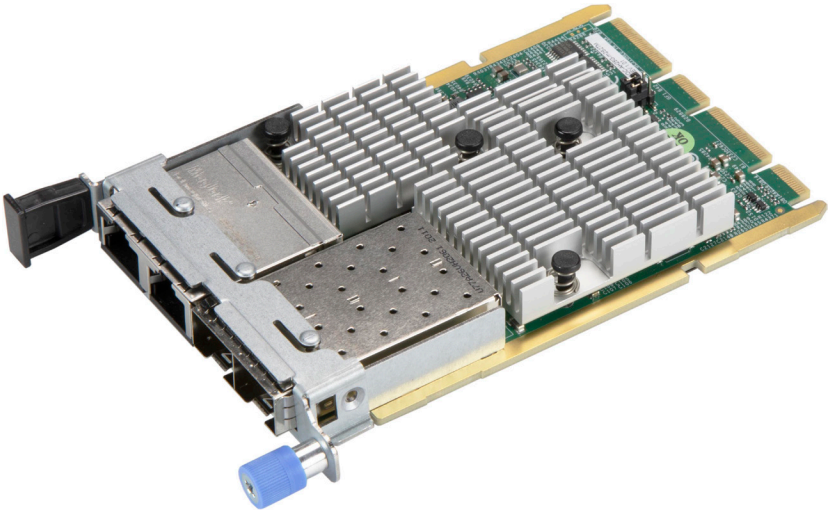
## 1-4 Available SKUs

| SKUs | Bracket Included | Description |
|---|---|---|
| **AOC-AH25G-m2S2TM** | BKT-0176L | 2-port 25 Gigabit and 2-port 10 Gigabit Ethernet Adapter with a 0.5 height bracket |

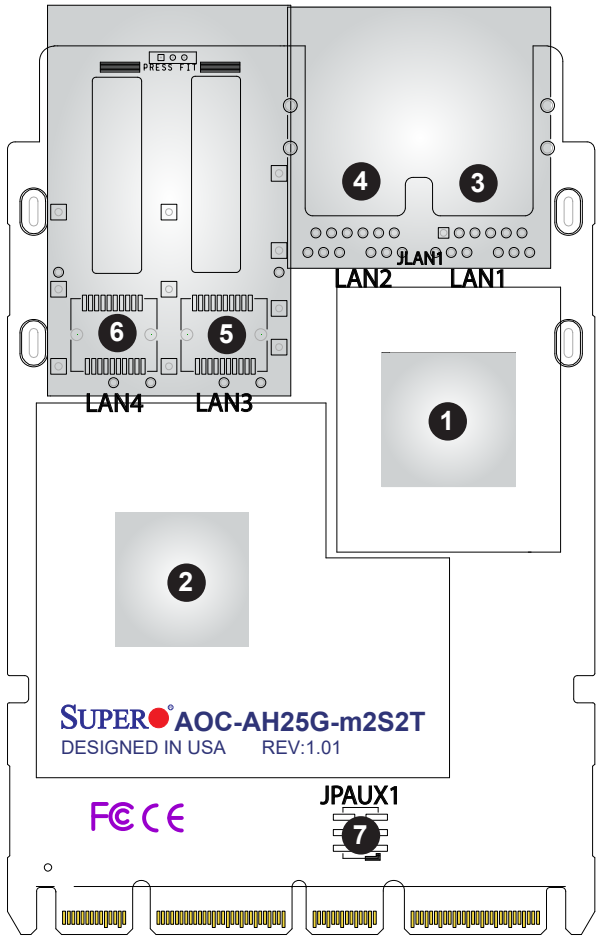
# Chapter 2

# Hardware Components

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



**AOC-AH25G-m2S2TM Image**




**AOC-AH25G-m2S2TM Layout**

## 2-2 Major Components

The following major components are installed on the AOC-AH25G-m2S2TM:

| AOC-AH25G-m2S2TM Major Components | | |
|---|---|---|
| **No** | **Component Name** | **Definition** |
| 1 | Intel® X550-AT2 | Ethernet LAN controllers |
| 2 | Mellanox® ConnectX®-4 Lx EN | Network connector |
| 3 | LAN1 | RJ45 Port1 |
| 4 | LAN2 | RJ45 Port2 |
| 5 | LAN3 | SFP28 Port1 |
| 6 | LAN4 | SFP28 Port2 |
| 7 | JPAUX1 | 1-3 and 2-4: Enable AUX Power in S5 |
| | | 3-5 and 4-6: Disable AUX Power in S5 |

## 2-3 SFP28 & RJ45 Ethernet Connections

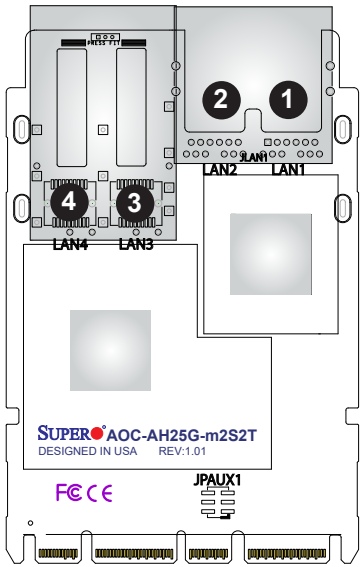
### SFP28 & RJ45 Ethernet Connectors

There are a total of four ports located on AOC-AH25G-m2S2TM. Two of the ports are SFP28 (LAN3/ LAN4), which provide network speed up to 25GbE. The other two ports (LAN1/ LAN2) are based on RJ45 connection type and support the speed up to 10GbE. See the layout below for the locations.

### Link/Activity LED Indicators

10G LAN has one bi-colored LED per port (RJ45 – Link/Activity) and 25G LAN has two bi-colored LED per port (SFP28 – Link and Activity) at the bottom of PCB. Please refer to the table below for LED color definition.

| LAN Port Activity LED Indicators Assignment/State | | | |
|---|---|---|---|
| RJ45 Ports | LAN Port Speed (L) and Activity (A) | | |
| 10G LAN 1<br>10G LAN2 | 10Gbps | Green and Blink | |
| | 1Gbps | Amber and Blink | |
| | 100Mbps | Off | |
| SFP28 Ports | LAN Port Speed | Link (L) | Activity (A) |
| 25G LAN 3<br>25G LAN 4 | 25 Gbps | Green | Blink |
| | 10 Gbps | Amber | Blink |
| | 100Mbps | Off | Off |




1. RJ45 LAN Port1
2. RJ45 LAN Port2
3. SFP28 Port1
4. SFP28 Port2

## 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. See the motherboard layout pages for jumper locations.

| JPAUX1 for Standby Power | IPMI Support | FailOver Support | WoL Support |
|---|---|---|---|
| Disable = No standby power to AOC NIC | Yes | Yes | No |
| Enable = Standby power to AOC NIC | Yes | Yes | Yes |

| 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 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 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. Power down the system.
2. Unplug the power cord.
3. 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.
4. Familiarize yourself with the server, motherboard, and/or chassis documentation.
5. Confirm that your operating system includes the latest updates and hotfixes.

**Note**: This add-on card does not support hot plug. Please turn off the AC power and remove the power cord from the wall socket before you install or remove the add-on card.

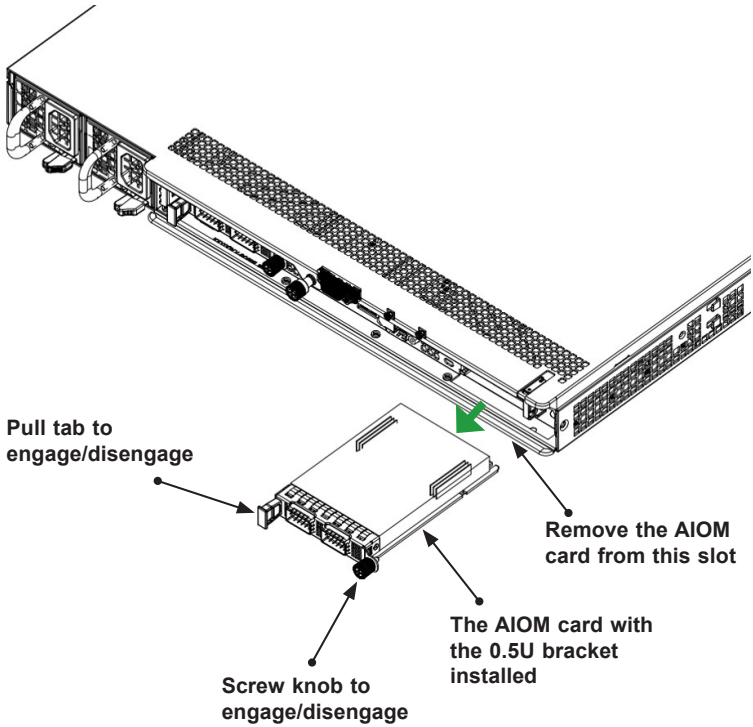
## 3-3 Installing the Add-on Card AOC-AH25G-m2S2TM (with 0.5U bracket)

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.

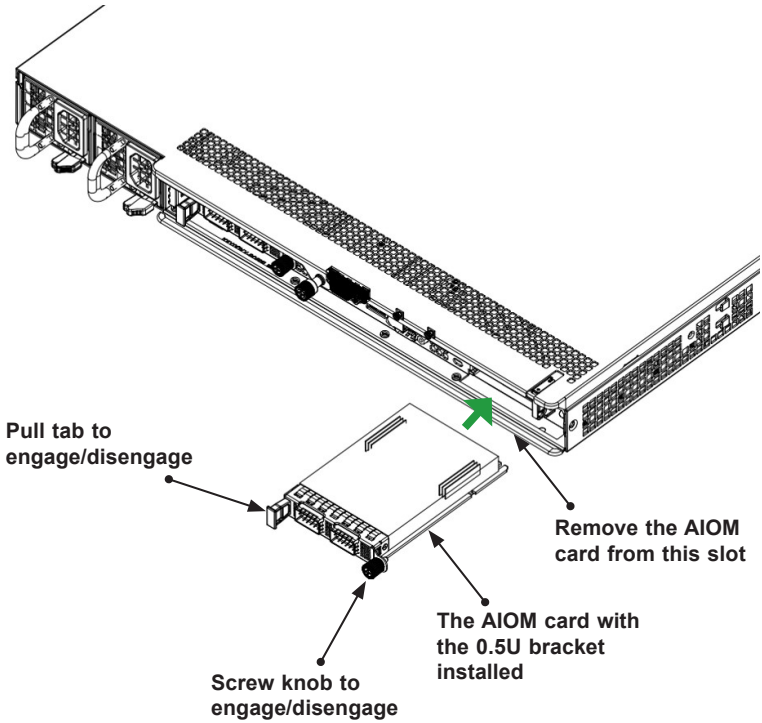
2. Pull on the tab and a knob evenly on both sides of the card to disengage the AIOM module from the motherboard connector, and then gently slide the AIOM module out.



**B. Installing an AIOM module**

1. Position the AIOM module in front of the empty slot and gently push 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 and secure it onto the chassis by turning the knob clockwise.

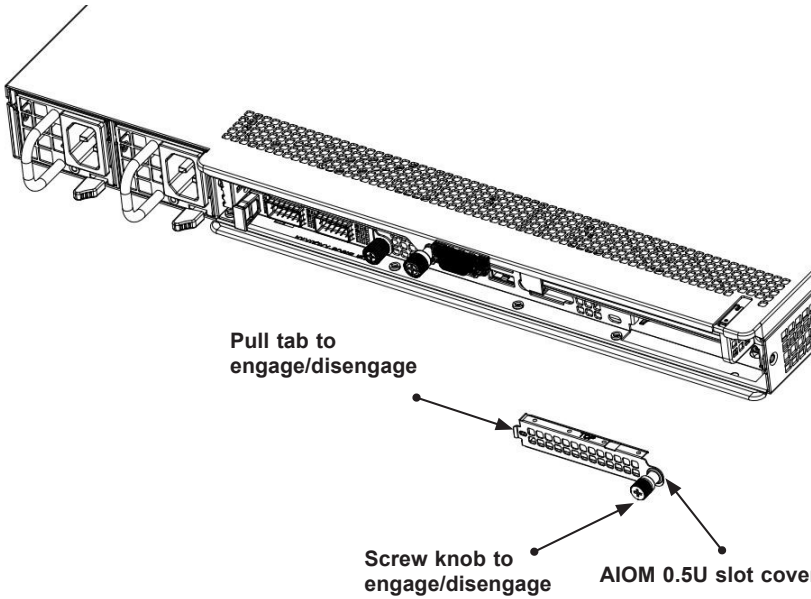


**C. Installing an AIOM module (An AIOM slot with an AIOM slot cover)**

1. 1. Remove the AIOM slot cover by unscrewing the knob and screw that attaches the bracket to the chassis. Pull the bracket away and set it aside.

2. Position the AIOM module in front of the empty slot and gently push 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 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:** Graphics shown above are for illustration purposes only. Actual products may vary due to product enhacement.

## 3-4 Installing Drivers on Windows (for Intel® X550)

Follow the steps below 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.




**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 Drivers on Linux (for Intel® X550)

Follow the steps below to install the drivers for Linux.

### Build a Binary RPM Package

1. Run 'rpmbuild -tb <filename.tar.gz>'

2. Replace <filename.tar.gz> with the specific filename of the driver.

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

Follow the instructions below to build the driver manually.

1. Move the base driver tar file to the directory of your choice. For example:

```
/home/username/ixgbe
```

or

```
/usr/local/src/ixgbe
```

2. Untar/unzip archive, where <x.x.x> is the version number for the driver tar file:

```
tar zxf ixgbe-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 ixgbe-x.x.x/src/
```

4. Compile the driver module:

```
make install
```

The binary will be installed as:

/lib/modules/[KERNEL_VERSION]/kernel/drivers/net/ixgbe/ixgbe.[k]o

The install locations listed above are the default locations. They may not be correct for certain Linux distributions. For more information, see the ldistrib.txt file included in the driver tar.

**Note:** IXGBE_NO_LRO is a compile time flag. The user can enable it at compile time to remove support for LRO from the driver. The flag is used

by adding CFLAGS_EXTRA=-"DIXGBE_NO_LRO" to the make file when it's being compiled.

make CFLAGS_EXTRA="-DIXGBE_NO_LRO" install

5. Load the module:

For kernel 2.6.x, use the modprobe command:

```
modprobe ixgbe <parameter>=<value>
```

For 2.6 kernels, the *insmod* command can be used if the full path to the driver module is specified. For example:

```
insmod /lib/modules/<KERNEL VERSION>/kernel/drivers/net/
ixgbe/ixgbe.ko
```

In addition, when using 2.6-based kernels, make sure that older ixgbe drivers are removed from the kernel before loading the new module. To do this, use:

```
rmmod ixgbe; modprobe ixgbe
```

6. Assign an IP address to the interface by entering the following, where x is the interface number:

```
ifconfig ethx <IP_address> netmask <netmask>
```

7. Verify that the interface works. Enter the following, where <IP_address> is the IP address for another machine on the same subnet as the interface that is being tested:

```
ping <IP_address>
```

## 3-6 Installing Drivers on FreeBSD (for Intel® X550)

Follow the instructions below to install the drivers for FreeBSD kernel 4.8 or later. In the instructions below, x.x.x is the driver version as indicated in the name of the drive tar file.

**Note**: You must have kernel sources installed in order to compile the driver module.

1. Move the base driver tar file to the dirctory of your choice. For example, use /home/username/ixgb or /usr/local/src/ixgb.

2. Untar/unzip the archive:

```
tar xfz ixgb-x.x.x directory
```

3. To install man page:

```
cd ixgb-x.x.x
gzip -c ixgb.4 > /usr/share/man/man4/ixgb.4.gz
```

4. To load the driver onto a running system, perform the following steps:

```
cd ixgb-x.x.x
make
```

or

```
cd ixgb-x.x.x/src
make load
```

5. To assign an IP address to the interface, enter the following:

```
ifconfig ixgb<interface_num> <IP_address>
```

6. Verify that the interface works. Enter the following, where <IP_address> is the IP address for another machine on the same subnet as the interface that is being tested:

```
ping <IP_address>
```

7. If you want the driver to load automatically when the system is booted:

```
cd ixgb-x.x.x/src
make load
cp if_ixgb.ko /modules
```

Edit /boot/loader.conf, and add the following line:

```
if_ixgb_load="YES"
```

or

compile the driver into the kernel (see item 8). Edit /etc/rc.conf, and create the appropriate ifconfig_ixgb<interface_num> entry:

```
ifconfig_ixgb<interface_num>="<ifconfig_settings>"
```

Example usage:

```
ifconfig_ixgb0="inet 192.168.10.1 netmask 255.255.255.0"
```

8. If you want to compile the driver into the kernel, enter:

```
cd ixgb-x.x.x/src
```

```
mkdir /usr/src/sys/dev/ixgb
cp if_ixgb* /usr/src/sys/dev/ixgb
cp ixgb* /usr/src/sys/dev/ixgb
cp Makefile.kernel /usr/src/sys/modules/ixgb/Makefile
```

Edit the /usr/src/sys/conf/files.i386 file, and add the following line:

```
dev/ixgb/ixgb_hw.c optional ixgb
dev/ixgb/ixgb_ee.c optional ixgb
dev/ixgb/if_ixgb.c optional ixgb
```

Remove the following lines from the /usr/src/sys/conf/files.i386 file, if they exist:

```
/dev/ixgb/if_ixgb_fx_hw.c optional ixgb
/dev/ixgb/if_ixgb_phy.c optional ixgb
```

Edit the kernel configuration file (i.e., GENERIC or MYKERNEL) in /usr/src/sys/i386/conf, and ensure the following line is present:

```
device ixgb
```

Compile and install the kernel. Reboot the system for the kernel updates to take affect.

## 3-7 Installing Drivers (for Mellanox® ConnectX®-4 Lx EN)

Use the procedures below to install both drivers and firmware for the AOC-AH25G-m2S2TM add-on card for both Linux and Windows.

### Linux Drivers

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

#### *Installing 25G Drivers for the Linux Operating System*

1. From the CDR-NIC LAN driver CD or FTP site, go to the following directory: Mellanox > Linux.
2. Download the Linux driver package file.
3. Install the driver by entering the following commands:

```
tar xzvf mlnx-en-<ver>.tgz

cd mlnx-en-<ver>

./install.sh
```

This installs the Linux drivers to your system.

### Windows Drivers

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

#### *Installing 25G Drivers for the Windows Operating System*

1. From the CDR-NIC LAN driver CD or FTP site, go to the following directory: Mellanox > Windows.
2. Choose the desired Windows driver package file.
3. Double-click to run and install the driver package file.

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