User's Guide

Revision 1.0
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WARNING: Handling of lead solder materials used in this product may expose you to lead, a chemical known to the State of California to cause birth defects and other reproductive harm.

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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-M25G-i2S/i2SM add-on card.

About this Add-on Card

The Supermicro® AOC-M25G-i2S/i2SM is one of the most advanced 25GbE controllers in the market. It provides two ports of 25GbE SFP28 connectivity in a small form factor SIOM and is based on the Intel® XXV710 chipset. The 25GbE bandwidth enables rapid networking deployment in an agile data center environment. Supermicro® Asset Management and thermal detection give the extra layer of controller health management and peace of mind. For customers who require faster and more reliable networking demands, the AOC-M25G-i2S/i2SM is an excellent choice to enhance network connectivity in data centers and enterprise environments.

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.
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

### AOC - MHBIF-m2Q2G

<table>
<thead>
<tr>
<th>Character</th>
<th>Representation</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>Product Family</td>
<td>AOC: Add On Card</td>
</tr>
<tr>
<td>2nd</td>
<td>Form Factor</td>
<td>S: Standard, P: Proprietary, C: MicroLP, M: SuperIO Module (SIOM), MH: SIOM Hybrid</td>
</tr>
<tr>
<td>4th</td>
<td>Chipset Model (Optional)</td>
<td>N: Niantec (82599), P: Powerville (i350), S: Sageville (X550), F: Fortville (XL710/X710), L: Lewisburg (PCH)</td>
</tr>
<tr>
<td>5th</td>
<td>Chipset Manufacturer</td>
<td>i: Intel, m: Mellanox, b: Broadcom</td>
</tr>
<tr>
<td>6th</td>
<td>Number of Ports</td>
<td>1: 1 port, 2: 2 ports, 4: 4 ports</td>
</tr>
<tr>
<td>7th</td>
<td>Connector Type (Optional)</td>
<td>S: SFP+/SFP28, T: 10GBase-T, Q: QSFP+, C: QSFP28</td>
</tr>
<tr>
<td>8th</td>
<td>2nd Controller/Connector Type (Optional)</td>
<td>G: 1x GbE RJ45, 2G: GbE 2x RJ45, S: 1x 10G SFP+, T: 10GBase-T, 2T: 2x 10GBase-T</td>
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### SMC Networking Add-on Cards

<table>
<thead>
<tr>
<th>Model</th>
<th>Type</th>
<th>Form Factor</th>
<th>Controller</th>
<th>Connection</th>
<th>Dimension (w/o Brackets) (L x H)</th>
<th>Power (W)</th>
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<tbody>
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<td>AOC-MGBF-2</td>
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<td>SIOM</td>
<td>Intel® i350 AM2</td>
<td>2 RJ45 (1Gb/port)</td>
<td>3.622” (92mm) x 3.428” (87.08mm)</td>
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<td>Controller</td>
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<td>PCI-E x8</td>
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<td>UIO FH</td>
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<td>AOC-CTG-i1S</td>
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<td>MicroLP</td>
<td>PCI-E x8</td>
<td>Intel® 82599EN</td>
<td>1 SFP+ (10Gb/port)</td>
<td>4.85&quot; (122mm) x 1.54&quot; (39mm)</td>
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<td>10Gbe</td>
<td>MicroLP</td>
<td>PCI-E x8</td>
<td>Intel® 82599ES</td>
<td>2 SFP+ (10Gb/port)</td>
<td>4.85&quot; (122mm) x 1.54&quot; (39mm)</td>
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<td>MicroLP</td>
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<td>1 SFP28 (25Gb/port)</td>
<td>4.45&quot; (113mm) x 1.54&quot; (39mm)</td>
</tr>
</tbody>
</table>
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Chapter 1

Overview

1-1 Overview

Congratulations on purchasing your add-on card from an industry leader. 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/info/networking.cfm#adapter.

1-2 Key Features

The key features of this add-on card include:

• Supermicro Super I/O Module (SIOM) Form Factor

• Intel® XXV710 25GbE controller, Dual SFP28 connectors

• Network Virtualization: VXLAN and NVGRE

• Intel® Ethernet Flow Director for hardware-based application and traffic steering

• Data Plane Development Kit (DPDK) optimized for efficient packet-processing

• NC-SI for Remote Management

• Asset Management Features

• RoHS compliant 6/6

1-3 Technical Specifications

General

• Super I/O Module (SIOM) Form Factor

• Intel® XXV710 25GbE controller

• Dual SFP28 connectors with speed up to 25Gbps per port

• Time Sync (IEEE1588)
I/O Features
- Intel® Ethernet Flow Director
- Intel® XXV710 25GbE controller
- MSI-X support
- Multiple queues: 1,536 Tx and Rx queues per port
- Tx/Rx IP, SCTP, TCP, and UDP checksum offloading (IPv4, IPv6) capabilities

Virtualization Features
- Next-Generation VMDq with up to 256 VMDq VMs supported
- SR-IOV
- Virtual Machine Load Balancing (VMLB)
- VLAN support
- VXLAN and NVGRE support

Management Features
- Preboot eXecution Environment (PXE) support
- iSCSI boot
- Asset Management features with thermal sensor support
- NC-SI for remote management

Advanced Software Features
- Teaming support
- IEEE 802.3ad (link aggregation control protocol)
- IEEE 802.1Q VLANs
• IEEE 802.3 2005 flow control support

• IEEE 802.1p

• Receive Side Scaling

**Operation System Support**

• Windows Server 2008 R2 / 2012 / 2012 R2 / 2016

• Linux Stable Kernel version 2.6/4.x

• Linux RHEL 6.9 / 7.3

• Linux SLES 11 SP4 / 12 SP1

• FreeBSD 10.3 / 11

• UEFI 2.1 / 2.3 / 2.4

• VMware vSphere 5.1 / 5.5

• VMware ESXi 6.0 U3 / 6.0

**Power Consumption**

• Maximum 11.8W

**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**

• Card PCB dimensions: 92mm (3.62in) x 87.1mm (3.43in) (W x D)
Supported Platforms

- Supermicro® motherboards with Super I/O Module slot built-in

- Supermicro® server systems with Super I/O Module slot built-in (see SIOM Compatibility Matrix online at http://www.supermicro.com/support/resources/AOC/AOC_Compatibility_SIOM.cfm)

**Note:** This product is sold only as part of an integrated solution with Supermicro server systems.
1-4 Available SKUs

<table>
<thead>
<tr>
<th>SKUs</th>
<th>Part Number</th>
<th>Description</th>
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<td>BKT-0144L</td>
<td>Swappable bracket for 2U+ chassis</td>
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<tr>
<td></td>
<td>BKT-0143L</td>
<td>Internal bracket</td>
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1-5 Similar Products

<table>
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<th>Form Factor</th>
<th>Speed</th>
<th>Connector Type</th>
<th>Total Ports</th>
<th>Controller</th>
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<td>SIOM</td>
<td>1GbE</td>
<td>RJ45</td>
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<td>10GbE</td>
<td>SFP+</td>
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<td>RJ45</td>
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<td>InfiniBand FDR &amp; GbE</td>
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<td>Omni-Path</td>
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1-6 Optional Parts List

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<tr>
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<td>SFP28 Copper Cable</td>
<td>CBL-NTWK-0944-MS28C05M</td>
<td>0.5m 25GbE SFP28 to SFP28, Passive</td>
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<td>CBL-NTWK-0944-MS28C30M</td>
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Chapter 2

Hardware Components

2-1 Add-On Card Image and Layout

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
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<td>1.</td>
<td>J2: PCIE 3.0 x16</td>
<td>6. LED1: Port 1 LED indicators</td>
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<td>Connector Cage</td>
<td>8. S1: DIP Switch</td>
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<td>9. LED3: Thermal Alert LED</td>
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<td>5.</td>
<td>SFP28 Port2</td>
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</table>
2-2 Major Components

The following major components are installed on the AOC-M25G-i2S/i2SM:

1. Intel® XXV710 25GbE network controller
2. Two SFP28 (Small Form Factor Pluggable) ports
3. Two (2) SFP28 Link/Activity LED indicators
4. System Management Bus (SMB)

2-3 SFP28 Ethernet Connections

SFP28 (SFP1/SFP2) Connectors

Two small form-factor pluggable (SFP28) optical transceiver connectors (SFP1 and SFP2) are located on the add-on card. These SFP28 ports provide Ethernet connections of up to 25GbE. See the layout next page for the locations.

SFP28 (SFP1/SFP2) Link/Activity LED Indicators

Two SFP28 Activity/Link LED indicators are located at LED1 and LED2 on the add-on card. LED1 is used for the SFP28 Port1 connector, and LED2, for the SFP28 Port2 connector. The SIOM LED1 and LED2 are dual bi-level LEDs: the top ones are link LEDs; the bottom ones are activity LEDs. See the tables below and image on the next page for the LEDs’ states and functions.
1. SFP28 Connectors
2. SFP28 Port LED Indicators

1. The Top LED: The Link Indicator
2. The Bottom LED: The Activity Indicator
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 previous page 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 Installing the Add-on Card

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

1. Remove the server cover, if any, and set aside any screws for later use.

2. Remove the add-on card slot cover. If the slot cover has a screw, place it aside for later use.

3. Position the add-on card in front of the SIOM slot and gently push in both sides of the card until it slides into the slot.

**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.
4. Secure the add-on card to the chassis, reusing the screws that you previously removed as needed.

5. Attach any necessary external cables to the add-on card.

6. Replace the system cover.

7. Plug in the power cord and power up the system.

Follow this step to install the add-on card if your system does not support a swappable bracket. Insert the SIOM card in the motherboard and then install the motherboard in the chassis. An internal bracket comes with the AOC-M25G-i2SM controller which needs to be installed into the chassis before the motherboard is inserted.

![Diagram of SIOM card installation](image)

**Note:** It is recommended that the SIOM card installation above be completed by a system integrator or the manufacturer.
Follow the steps below to install the add-on card into your system that supports a swappable bracket. The add-on card must be installed in the swappable bracket before it can be installed in your system.

1. Install the add-on card into the swappable bracket.

2. Position the add-on card in front of the SIOM slot and gently push in both sides of the card until it slides into the slot.

3. Once the card is in the slot, push both knobs in and turn to the right to lock the card in the system. The left knob has the unlock/lock symbols next to it. To ensure that the add-on is locked, make sure that the knob position indicator is pointing to the lock symbol.
3-4 Installing Windows Drivers (for Intel Fortville-25 XXV710)

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

1. Run the 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 Linux Drivers (for Intel Fortville-25 XXV710)

Follow the steps below to install the driver to a Linux system.

1. Build a binary RPM package by running this command:

   \[ \text{rpmbuild -tb} \ <\text{filename.tar.gz} > \]

2. Be sure to replace \(<\text{filename.tar.gz}\>\) in the above step (#1) with the specific filename of the driver.

   \[
   \text{\textbf{Note:} For the build to work properly, the current running kernel \textbf{must} match the version and configuration of the kernel sources that are already installed in your system. If you have just recompiled the kernel, reboot the system at this time.}
   \]

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

   \[
   \text{/home/username/i40e} \\
   \text{or} \text{/usr/local/src/i40e}
   \]

4. Untar/unzip archive, where \(<x.x.x>\) is the version number for the driver tar file:

   \[
   \text{tar zxf i40e-x.x.x.tar.gz}
   \]

5. Change to the driver src directory, where \(<x.x.x>\) is the version number for the driver tar:

   \[
   \text{cd i40e-x.x.x/src/}
   \]

6. Compile the driver module:

   \[
   \text{make install}
   \]

   Install the binary as:

   \[
   \text{/usr/local/src/i40e}
   \]

7. Load the module. For kernel 2.6.x, use the modprobe command:

   \[
   \text{modprobe i40e <parameter>=<value>}
   \]

   For 2.6 kernels, the ‘\text{insmod}’ command can be used if the full path to the driver module is specified. For example:
Chapter 3: Installation

insmod /lib/modules/[KERNEL_VERSION]/kernel/drivers/net/ethernet/intel/i40e.[k]o

In addition, when using 2.6-based kernels, make sure that older i40e drivers are removed from the kernel before loading the new module. To do this, use:

rmmod i40e; modprobe i40e

8. Assign an IP address to the interface by entering the following command where "x" at the end of "ethx" is the interface number:

    ifconfig ethx <IP_address> netmask <netmask>

9. To verify that the interface is working properly use the following command where "<IP_address>" is the IP address of the machine on the same subnet as the interface that is being tested:

    ping <IP_address>
(Disclaimer Continued)

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