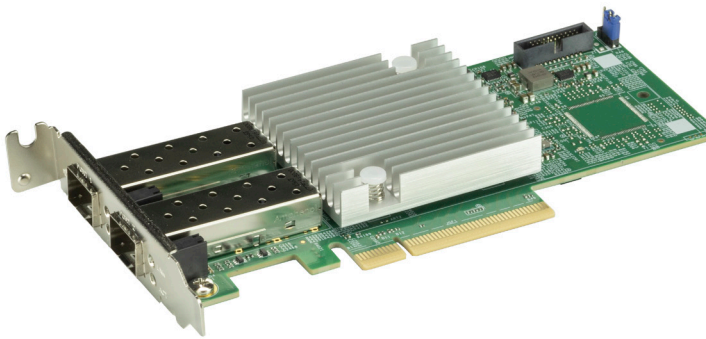
AOC-S25GC-i2S



User's Guide

Revision 1.0

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User's Guide Revision 1.0

Release Date: June 21, 2021

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Preface

About this User's Guide

This user's guide is written for system integrators, IT professionals, and knowledgeable end users. It provides information for the installation and use of the AOC-S25GC-i2S add-on card.

About this Add-On Card

The Supermicro AOC-S25GC-i2S features Intel's state of the art Columbiaville E810-XXVAM2 Ethernet solution that delivers high-performance, cutting edge technology supporting a 25Gb per second transfer rate and PCI-E Gen 4-/PCI-E Gen 3-compatible architecture. It also supports RoCE v2, iWarp, DCDB, VXLAN, NVGRE, and Geneve. With the support of Advance Device Queue and Dynamic Device Personalization that delivers faster application response with lower latency, AOC-S25GC-i2S is an excellent network solution for cloud-scale networking, telecommunication, machine learning, and big data analytics.

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 of 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 User's Guide

Pay special attention to the following symbols for proper system installation:



Warning: Important information given to ensure proper system installation and to avoid possible damage done to the components or injury to yourself.



Note: Additional information given for proper system setup.

Important Links

For your system to work properly, please follow the links below 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: ftp://ftp.supermicro.com
- Product safety info: http://www.supermicro.com/about/policies/safety_information.cfm
- If you have any questions, please contact our support team at: support@supermicro.com

This manual may be periodically updated without notice. Please check the Supermicro website for possible updates to the manual revision level.i

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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 in quality and performance.

1-2 Key Features

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

- Dual Port SFP28 connector
- Low-profile, short length Standard Form Factor
- PCI-E 4.0 x8 backward compatible to PCI-E 3.0 x8
- Intel® E810-XXVAM2 Ethernet Controller
- Asset Management Feature with thermal sensor
- Intel® Ethernet Flow Director – Application Device Queues (ADQ)
- Data plan development kit
- Low Latency RDMA over Converged Ethernet (iWARP and RoCE v2)
- VxLAN, NVGRE, and Geneve
- Jumbo Packet (9K Max)
- NC-SI for IPMI support
- RoHS compliant 6/6
- Dynamic Device Personalization (DDP)

1-3 Technical Specifications

General

- Intel® E810-XXVAM2 Ethernet Controller
- Compact size low-profile standard form factor
- PCI-E 4.0
- Dual QSFP28 connectors
- Advance Device Queues (ADQ)
- Dynamic Device Personalization (DDP)

Host Interface

- PCI-E v4.0
- Backward compatible with PCIe v3.0
- Message Signal Interrupt (MSI-X)

Networking Features

- Jumbo Packet (9K Max)
- Teaming
- Virtual LANs 802.1q VLAN tagging

Stateless Offload Features

- TCP, UDP, IPv4, IPv6 checksum offload
- Large Send Offload
- Receive Segment Coalescing
- TCP segmentation Offload (TSO)

- UDP Segment Offload (USO)
- Large Segment Offload (LSO)
- Receive Side Scaling (RSS)

Virtualization Features

- VXLAN
- NVGRE
- Geneve
- SR-IOV
- 768 Virtual Station Interface (VSI)
- 8 Physical Functions (PF)
- Microsoft VM Queue
- VMWare NetQueue
- DPDK support
- QoS: Priority-based Flow Control (802.1Qbb)
- Enahanced Transmission Selection (802.1Qaz)

RDMA over Converged Ethernet (iWARP and RoCE)

- iWARP
- RoCEv2
- Data Center Bridging

Manageability

- Network Controller Sideband Interface (NC-SI)*
- Asset Management with thermal sensors

Remote Boot

- iSCSI Boot
- Legacy PXE Boot
- UEFI PXE Boot

Data Center Bridging

- Enhanced transmission – IEEE 802.1Qaz
- Priority based Flow Control – IEEE 802.1Qbbb
- Edge Virtual Bridging - IEEE 802.Qbg

Power Saving

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

Operating Conditions

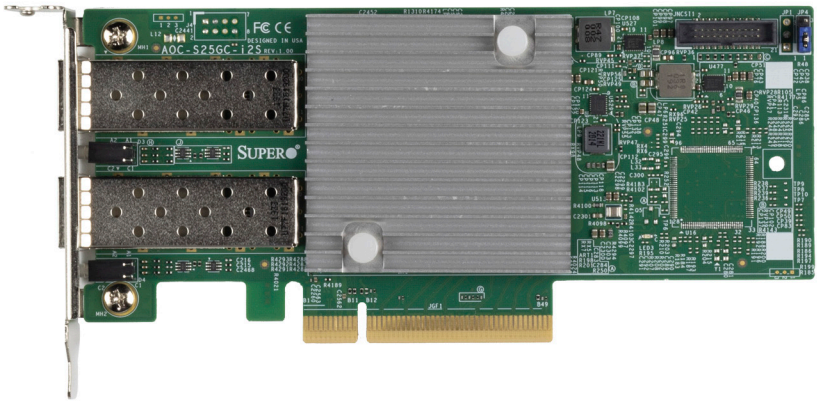
- Operating temperature: 0°C to 55°C (32°F to 131°F)
- Storage temperature: -40°C to 70°C (-40°F to 158°F)
- Storage humidity: 90% non-condensing relative humidity at 35°C

Note: Card requires NC-SI cable and motherboard support.

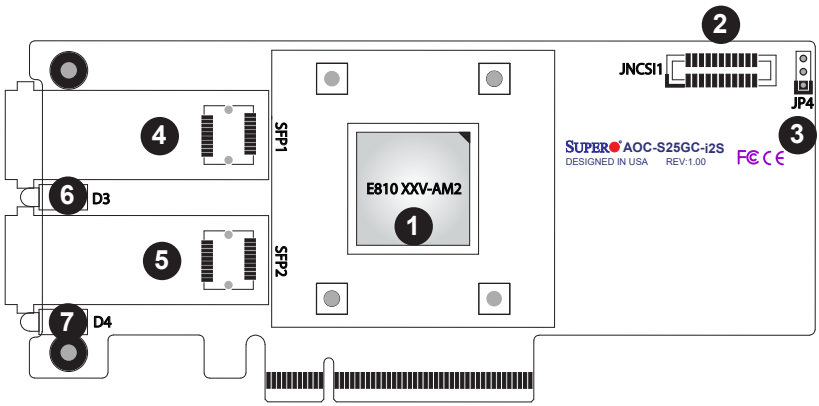
Chapter 2

Hardware Components

2-1 Add-On Card Image and Layout



AOC-S25GC-i2S View



AOC-S25GC-i2S Layout

2-2 Major Components

The following major components are installed on the AOC-S25GC-i2S:

AOC-S25GC-i2S Major Components		
No	**Component Name**	**Definition**
1	Intel® E810-XXVAM2	Ethernet 25Gb Controller
2	JNCSI1	NCSI header
3	JP4	1-2: Standby Mode Disable (default)
		2-3: Standby Mode Enable
4	SFP1	SFP28 Port 1
5	SFP2	SFP28 Port 2
6	D3	SFP LAN1 LED
7	D4	SFP LAN2 LED

2-3 SFP28 Ethernet Connections

SFP28 (LAN1/LAN2) Connectors

Two small form-factor pluggable (SFP28) optical transceiver connectors (SFP1/ SFP2) are located on the add-on card. These SFP28 ports provide Ethernet 25GbE/10GbE network connections. See the layout below for the locations.

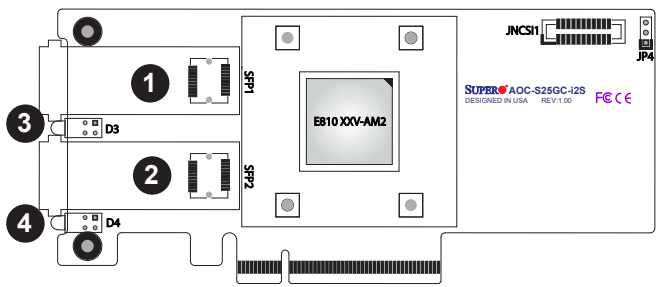
SFP28 (LAN1/LAN2) Link/Activity LED Indicators

Two LAN Link/Activity LED indicators are located at D3 and D4 on the add-on card. D3 is used for the SFP28 LAN1 connector, and D4, for SFP28 LAN2 connector. See the tables below for the LED states.

LAN Port Activity LED Indicators D3/D4 Assignment/State	
LED	LAN Port Assigned
D3	SFP LAN1 Active
D4	SFP LAN2 Active
Green	SFP LAN Port Active

LAN Port Link LEDs (D3/D4) LED State	
LED Color	Definition
Amber	10 Gbps
Green	25 Gbps

1. SFP28 LAN1
2. SFP28 LAN2
3. D3: SFP28 LAN1 LED
4. D4: SFP28 LAN2 LED

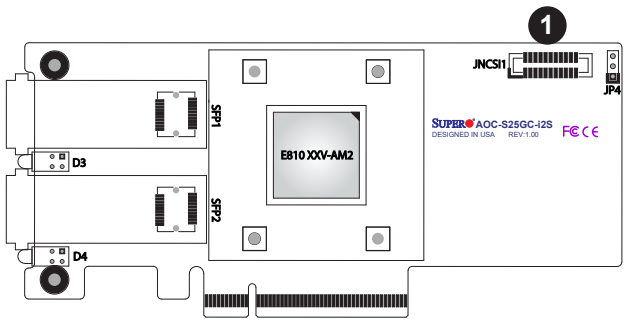


2-4 NCSI Header

NCSI Header

A Network-Controller Sideband Interface (NCSI) header is located at JNCSI1 on the add-on card. Connect an appropriate cable from this header to a motherboard to provide the out-of-band (sideband) connection between the onboard Baseboard Management Controller (BMC) and a Network Interface Controller (NIC) for remote management. For the network sideband interface to work properly, you will need to use a motherboard that supports NCSI and also need to have a special cable. Please contact Supermicro at www.supermicro.com to purchase the cable for this header. See the layout below for the location of the JNCSI1 header.

1. NCSI header

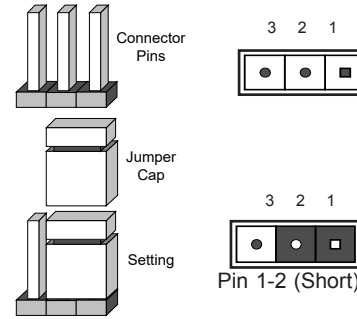


2-5 Jumper Settings

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.

Note: On two pin jumpers, "Closed" means the jumper is on, and "Open" means the jumper is off the pins.



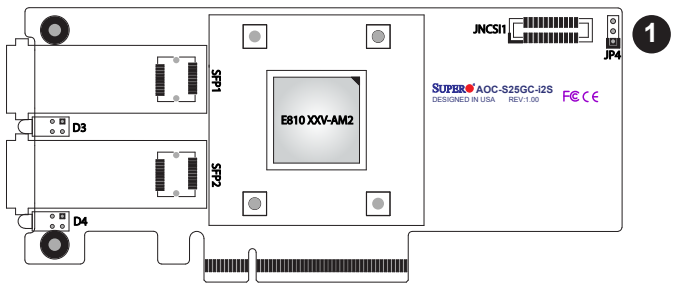
Pin 1-2 (Short)

3.3V Standby Power Enable

The 3.3V Standby Power Enable jumper is located at JP4 on the add-on card. Close Pins 1 and 2 to enable 3.3V Standby Power support. Please consult Supermicro before enabling it. The default setting is **Disable**.

JP4 for NC-SI Standby by Power	BMC Support	FailOver Support	WoL Support	Function	Notes
Disable = No standby Power to AOC NIC	Yes	Yes	No	Disable jumper to disconnect the standby power	Default
Enable = Standby Power to AOC NIC	Yes	Yes	Yes	Enable jumper to connect standby power to AOC NIC	Wake-on-LAN (WoL) is supported but limited to platforms with sufficient air-flow when it is in standby mode (S5 state). Please consult Supermicro before enabling it.

1. Standby Power



Chapter 3

Installation



Note: Your system came with the AOC-S25GC-i2S 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 re-installed. However, if you do need to remove or re-install a system component, including this add-on card, please follow the instructions below 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.

3-2 Before Installation

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

1. Power down the system.
2. Remove the power cord from the wall socket.
3. Use industry-standard anti-static equipment (such as gloves or wrist strap) and follow the instructions listed 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.

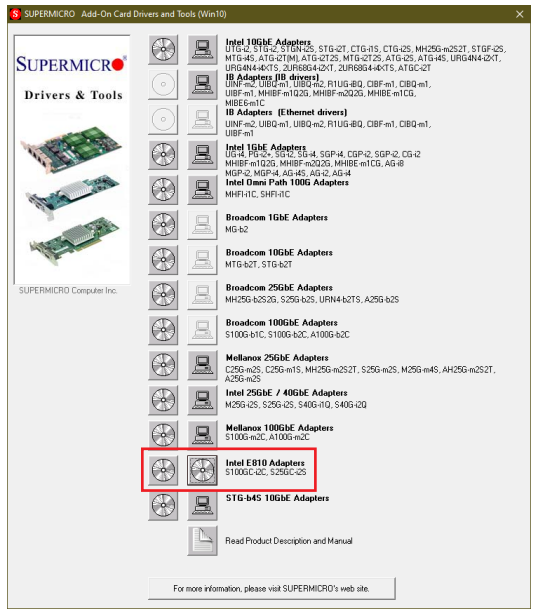
3-3 Installing the Add-on Card

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

1. Remove the server cover and, if necessary, set aside any screws for later use.
2. Remove the add-on card slot cover. If the case requires a screw, place the screw aside for later use.
3. Position the add-on card in the slot directly over the connector on the motherboard, and gently push down on both sides of the card until it slides into the PCI connector.
4. Secure the add-on card/motherboard to the chassis. If required, use the screw that you previously removed.
5. Attach any necessary external cables to the add-on card.
6. Replace the chassis cover.
7. Plug the power cord into the wall socket, and power up the system.

3-4 Installing Drivers (for Intel®E810-XXVAM2)

To install both drivers and firmware for the AOC-S25GC-i2S add-on card for either Linux and Windows, please follow the instructions below.



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.

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 Driver

Please follow the steps below to manually build 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 zxf 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 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.

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>
```

(Disclaimer Continued)

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