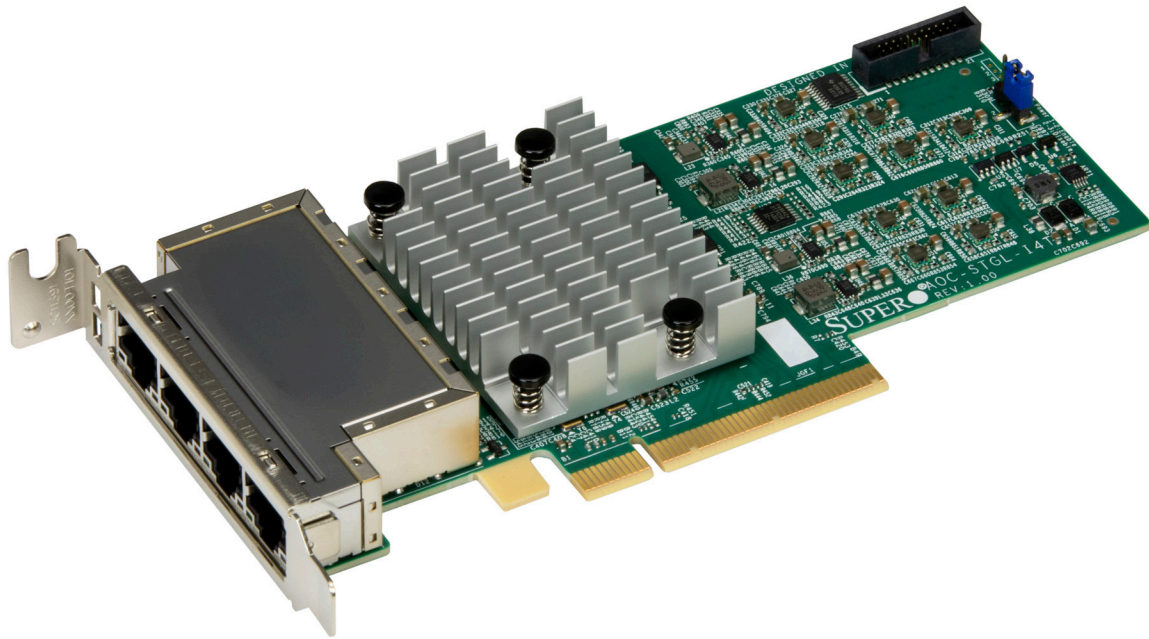




# AOC-STGL-I4T



## USER'S MANUAL

Revision 1.0

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Manual Revision 1.0

Release Date: January 14, 2026

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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-STGL-I4T add-on card.

## About This Add-On Card

Supermicro® AOC-STGL-I4T is powered by two Intel® E610-XAT2 controllers, providing four 10GBASE-T RJ45 ports for enhanced connectivity. With advanced security features, including standards-based cryptographic security, hardware Root of Trust (RoT), SPDM, and secure firmware updates, this card strengthens Ethernet security while maintaining high-speed, reliable networking.

## 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 (<https://www.supermicro.com/en/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: <https://www.supermicro.com/en/about/policies/safety-information>
- 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/](https://www.supermicro.com/about/policies/disclaimer.cfm?url=/wdl/utility/Lot9_Secure_Data_Deletion_Utility/)
- If you have any questions, contact our support team at: [support@supermicro.com](mailto:support@supermicro.com)
- Frequently Asked Questions: <https://www.supermicro.com/FAQ/index.php>
- If you have any feedback on Supermicro product manuals, contact our writing team at: [Techwriterteam@supermicro.com](mailto:Techwriterteam@supermicro.com)

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

## Naming Convention

**AOC-STGF-i2S**  


Character	Representation	Options
1st	Product Family	AOC: Add On Card
2nd	Form Factor	S: Standard PCIe, P: Proprietary, C: MicroLP, M: Super IO Module (SIOM), MH: SIOM Hybrid A: Advanced IO Module (AIOM), AH: AIOM Hybrid, SD: PCIe DPU
3rd	Product Type/Speed	G: GbE (1Gb/s), TG: 10GbE (10Gb/s), 25G: 25GbE (25Gb/s), 40G: 40GbE (40Gb/s), 100G: 100GbE (100Gb/s), 200G: 200GbE (200Gb/s), 400G: 400GbE (400Gb/s), 800G: 800GbE (800Gb/s)
4th	Chipset Model (Optional)	N: Niantic (82599), P: Powerville (i350), S: Sageville (X550), F: Fortville (XL710/X710), C: Columbiaville (E810 25/100G) or Carlsville (X710-AT2/TM4 10G), L: Linkville (E610), CN: Connersville (E835), 6: ConnectX-6, 7: ConnectX-7, 8: ConnectX-8
5th	Chipset Manufacturer	i or I: Intel, b or B: Broadcom, m or M: Mellanox, N: NVIDIA
6th	Number of Ports	1: 1 port, 2: 2 ports, 4: 4 ports
7th	Connector Type (Optional)	S: SFP/SFP+/SFP28, T: 10GBase-T, Q: QSFP+, C: QSFP28/QSFP56/QSFP112/QSFP-DD, O: OSFP

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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:

- PCIe 4.0 low-profile form factor
- Two Intel E610-XAT2 10 GbE controllers
- Speed Support: 10 GbE
- 10GBASE-T RJ45 connectors
- Interface: PCIe Gen 4.0 x8 (x4+x4) and backward compatible PCIe Gen 3.0
- Networking Capabilities: VXLAN, NVGRE, and Geneve
- Asset Management: PLDM for monitoring with thermal sensors, FW update
- Remote Management: Network Controller Sideband Interface (NC-SI) for remote management

## 1.3 General Specifications

### General

- PCIe 4.0 low-profile form factor
- Two Intel E610-XAT2 10 GbE controllers with quad RJ45 ports
- Multi-speed support: 100 MbE, 1 GbE, 2.5 GbE, 5 GbE, 10 GbE

### Virtualization Features

- VXLAN
- NVGRE
- Geneve
- SR-IOV
- DPDK support

### Management and Control

- SMBus 2.0
- Network Controller Sideband Interface (NC-SI)
  - Disabled by default in standby mode
  - Requires Standby mode Enabled and an NC-SI cable to the motherboard with an NC-SI header connection



**Note:** Consult Supermicro for NC-SI and Standby power for more details.

- NC-SI, MCTP over SMBus, and PCIe
- PLDM for Monitor and Control DSP0248
- PLDM for Firmware Update DSP0267
- PLDM for Redfish Device Enablement Specification (RDE)
- SPDM over MCTP

## **Remote Boot**

- Legacy PXE
- UEFI PXE
- UEFI support for x86

## **Stateless Offload**

- Large Segment Offload (LSO)
- Large Receive Offload (LRO)
- Transmit Side Scaling (TSS)
- Receive Side Scaling (RSS)
- Checksum Offload (TCP/UDP/IP)
- TCP Segment Offload (TSO)
- UDP Segment Offload (USO)

## **Standards Compliance**

- IEEE 802.3an (10GBASE-T)
- IEEE 802.3bz (5/2.5GBASE-T)
- IEEE 802.ab (1GBASE-T)
- IEEE 802.3u (100BASE-TX)
- IEEE 802.3az (Energy Efficient Ethernet)
- IEEE 802.1Q, 802.1P (VLAN tags and priority)
- IEEE 802.1Qaz (ETS)
- IEEE 802.1Qbb (PFC)
- IEEE 802.1Qbg
- IEEE 1588v2
- IEEE 1149.1 (JTAG)

- PCI Express Gen 3.0 and 4.0

### Power Consumption

- Maximum power consumption: 10.6 W

### Environmental Conditions

- Storage temperature: -40°C to 70°C (-40°F to 158°F)
- Storage humidity: 90% non-condensing relative humidity at 35°C (95°F)

### Physical Dimensions

- Card PCB dimensions: 5.906" x 2.713" (150.01 mm x 68.91 mm) (L x W)

## 1.4 Available SKUs

Product Part Number	Bracket Included	Description
BKT-0138L	Yes	LP L-Bracket, including 1x Screw M3x4L
BKT-0139L	Yes	FH L-Bracket, including 1x Screw M3x4L



**Note:** 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

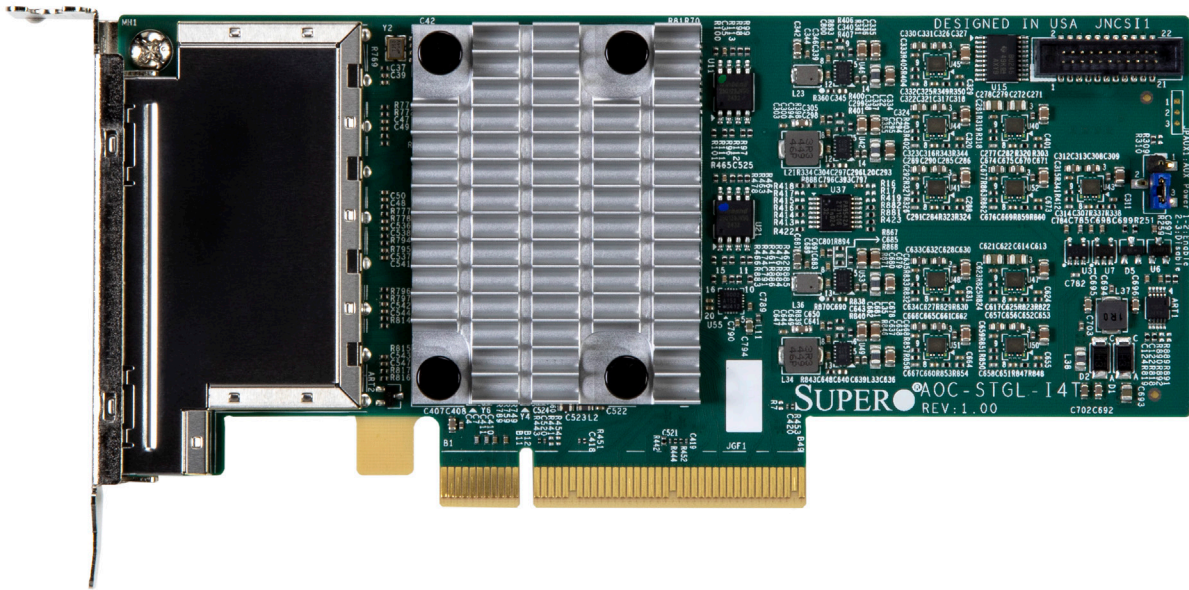


Figure 2-1: AOC-STGL-I4T Top View

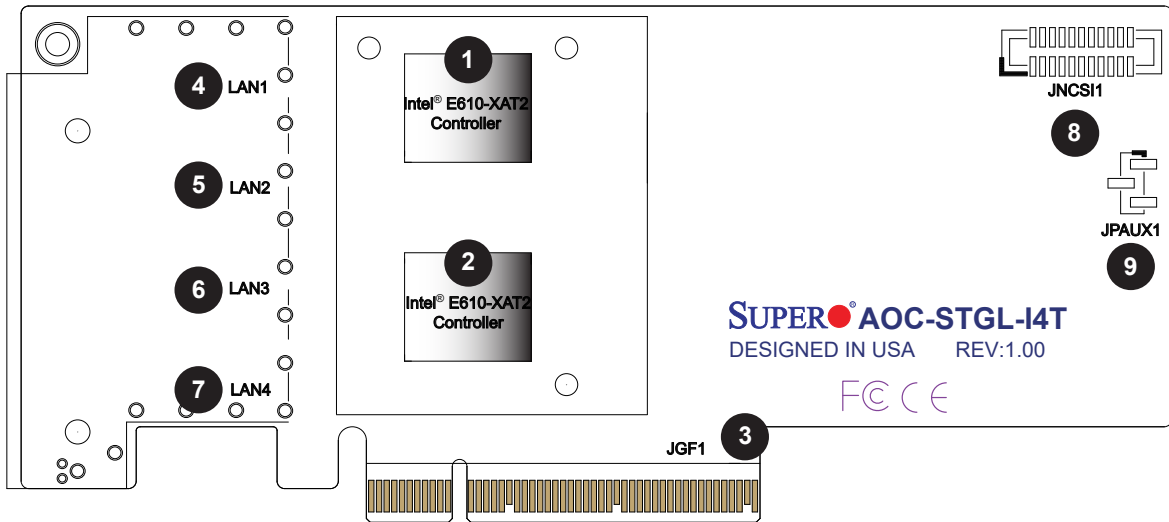


Figure 2-2: AOC-STGL-I4T Top Layout

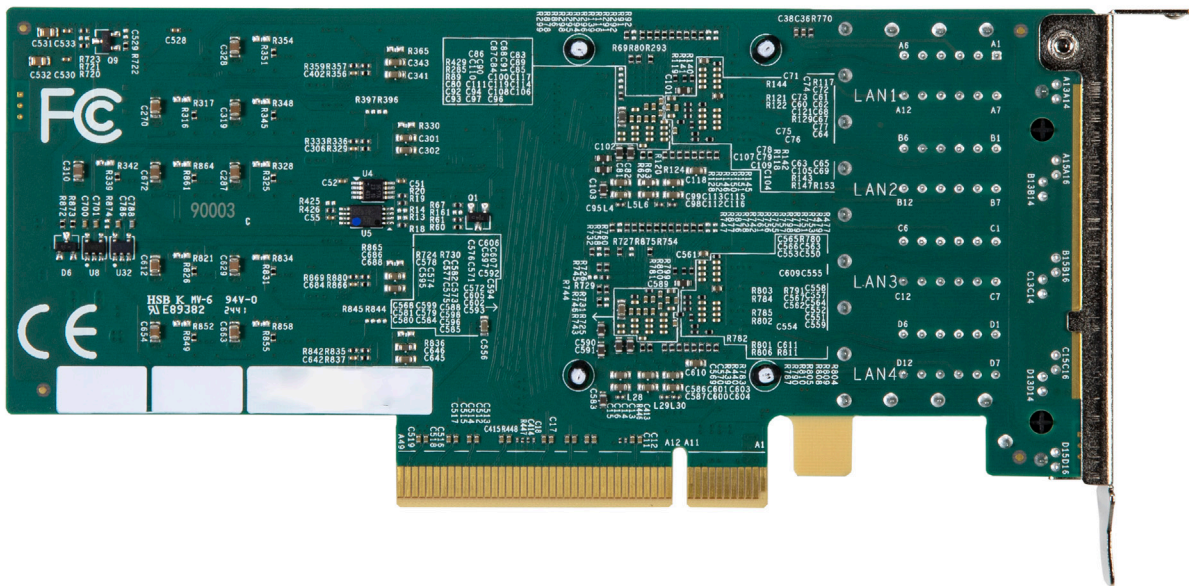


Figure 2-3: AOC-STGL-I4T Bottom View

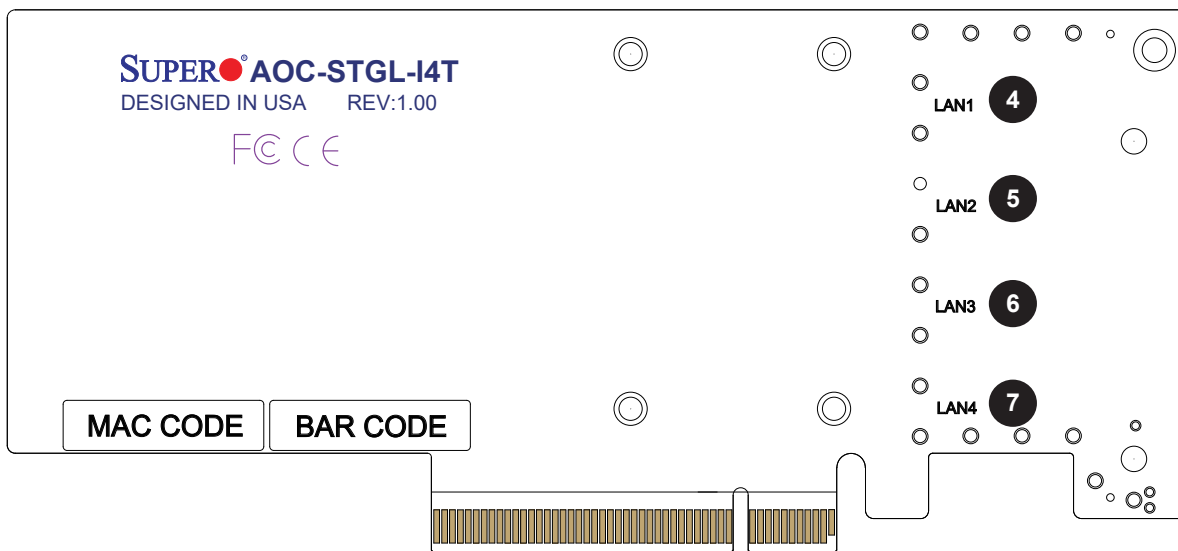


Figure 2-4: AOC-STGL-I4T Bottom Layout

## 2.2 Major Components

The following major components are installed on the AOC-STGL-I4T:

AOC-STGL-I4T Major Components		
No	Component Name	Definition
1	Intel E610-XAT2	10 GbE Ethernet LAN Controller
2	Intel E610-XAT2	10 GbE Ethernet LAN Controller
3	JGF1	PCIe Gen 4.0 x8 Form Factor
4	LAN1	RJ45 LAN Port 1
5	LAN2	RJ45 LAN Port 2
6	LAN3	RJ45 LAN Port 3
7	LAN4	RJ45 LAN Port 4
8	JNCSI1	NC-SI Connector
9	JPAUX1	Pins 1–2: Enable AUX Power in S5
		Pins 2–3: Disable AUX Power in S5

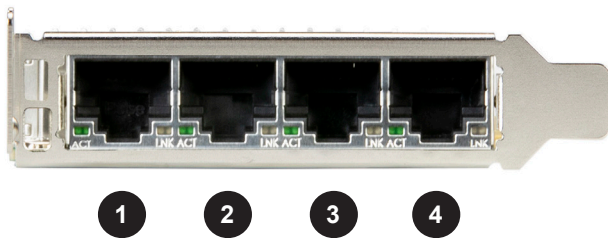


**Note:** Lane reversal may occur as it is subject to motherboard design requirements.

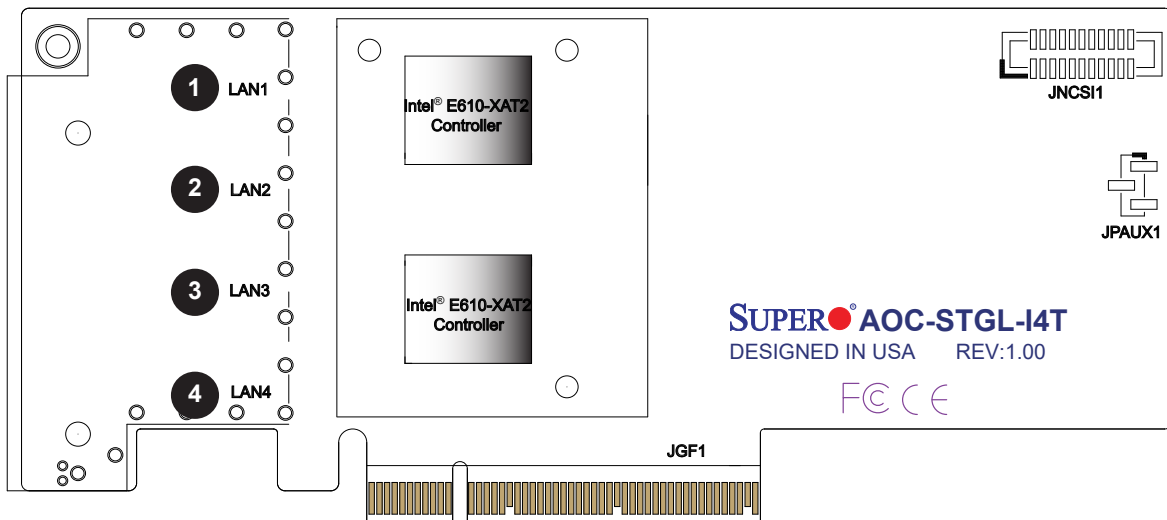
## 2.3 Ethernet Connections

### RJ45 Ethernet Connectors

There is a total of four RJ45 ports located at LAN1/LAN2/LAN3/LAN4 on AOC-STGL-I4T, which provide network speeds of up to 10 GbE. Use a direct-attach RJ45 type LAN cable to connect them to the motherboard.



1. RJ45 LAN Port 1
2. RJ45 LAN Port 2
3. RJ45 LAN Port 3
4. RJ45 LAN Port 4



## Link and Activity LED Indicators

The 10 GbE LAN has one bi-colored LED per port (RJ45 — Link and Activity) at the bottom of the Printed Circuit Board (PCB).

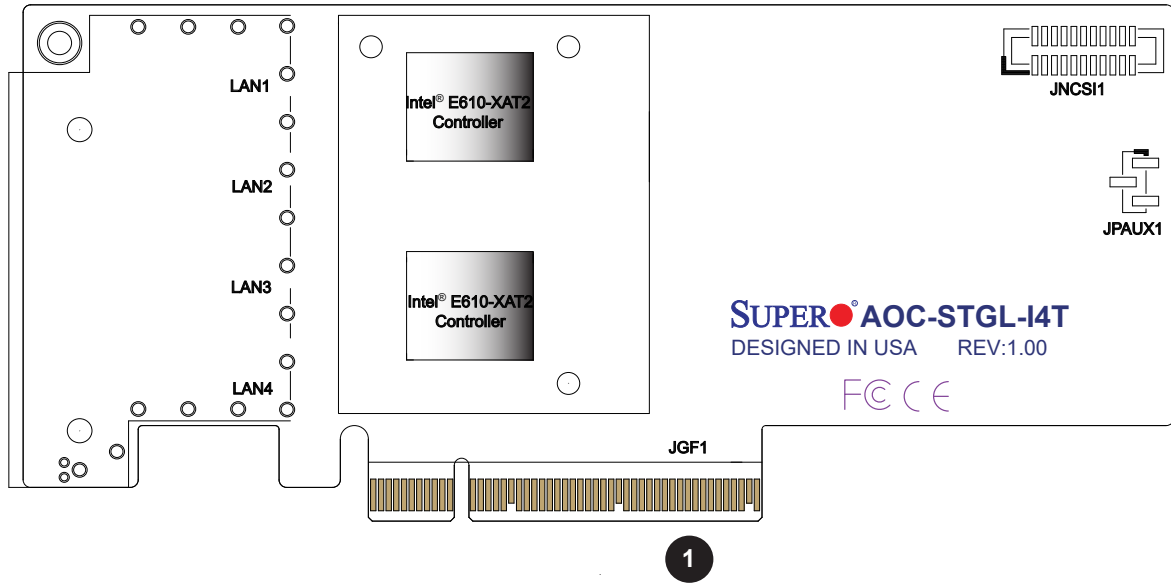
LAN Port Link LED (Right) LED State	
LED Color	Definition
Green	10 Gbps
Amber	<10 Gbps

LAN Port Activity LED (Left) LED State		
LED Color	Status	Definition
Off	Off	No Connection
Green	Solid	Link
Green	Flashing	Active

## PCIe 4.0 x8 Connector

A PCIe 4.0 x8 connector is located at JGF1 on AOC-STGL-I4T. Insert this connector into a PCIe 4.0 x8 slot on a motherboard to use the AOC-STGL-I4T card.

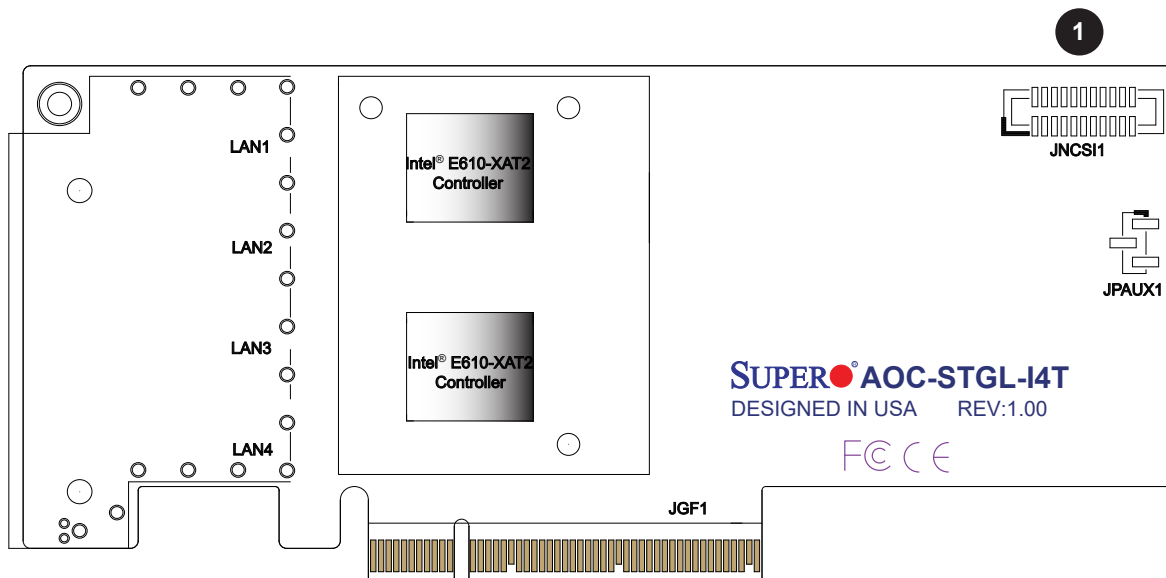
### 1. PCIe 4.0 x8 Connector



## 2.4 NC-SI Header

A Network-Controller Sideband Interface (NC-SI) header is located at JNCSI1 on AOC-STGL-I4T. 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 special cable and a motherboard that supports NC-SI. Contact Supermicro at [www.supermicro.com](http://www.supermicro.com) to purchase the cable for this header.

### 1. NC-SI 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 PCB.

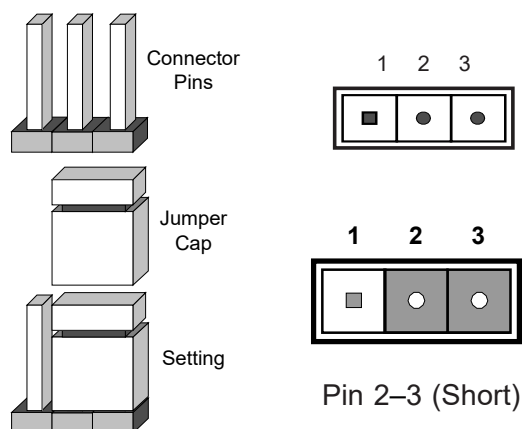


Figure 2-4: Three-Pin Jumper

JPAUX1 for Standby Power	IPMI Support	FailOver Support	WoL Support
Disable <i>No standby power to AOC NIC</i>	Yes	Yes	No
Enable <i>Standby power to AOC NIC</i>	Yes	Yes	Yes

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 standby power to AOC NIC	WoL is supported on LAN1 and LAN2 only, but is 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-STGL-I4T 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 21](#) 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.



**Note:** This add-on card does not support hot plug. 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

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's top cover for ease of installation.

1. Remove the server cover and, if any, 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.
4. Gently push down on both sides of the card until it slides into the PCI connector.
5. Secure the add-on card to the chassis. If required, use the screw that you previously removed.
6. Attach any necessary external cables to the add-on card.
7. Replace the chassis cover.
8. Plug the power cord into the wall socket and power up the system.

## 3.4 Installing the Drivers on Windows (for Intel E610-XAT2)

Download the drivers from the Intel driver site for the [Intel Ethernet Adapter Complete Driver Pack](#).

## 3.5 Installing the Drivers on Linux (for Intel E610-XAT2)

Follow the steps to install the drivers on the Linux operating system:

### 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.

Take the following steps 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. You 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:

```
rmmmod 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.

#### 8. 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 the Drivers on FreeBSD (for Intel E610-XAT2)

Take the following steps to install the drivers for FreeBSD kernel 4.8 or later. In the following instructions, 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 directory 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 the main 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.
7. 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>
```

8. 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 you can 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"
```

9. 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 effect.

(Disclaimer Continued)

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