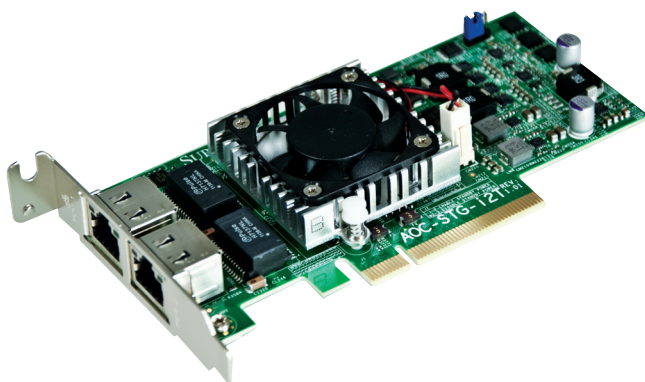




# AOC-STG-i2T



## User's Guide

Revision 1.0

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---

California Best Management Practices Regulations for Perchlorate Materials: This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. "Perchlorate Material-special handling may apply. See [www.dtsc.ca.gov/hazardouswaste/perchlorate](http://www.dtsc.ca.gov/hazardouswaste/perchlorate)".

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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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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-STG-i2T add-on card.

### About this Add-on Card

The Supermicro AOC-STG-i2T is the most energy-efficient and cost-effective 10GbE adapter solution for data centers in today's market. The AOC-STG-i2T offers auto-negotiation between 1GbE and 10GbE, supporting backward compatibility for smooth transition from 1GbE to 10GbE. It addresses the demands of bandwidth-intensive applications at a fraction of the cost of a traditional 10GbE adapter by utilizing RJ-45 connections for a longer cabling distance. The Supermicro AOC-STG-i2T 10GbE adapter is truly a best-in-class solution for advanced data centers. This add-on card is intended to be used with Supermicro's servers or motherboards as an integrated solution package. For more information regarding product support or updates, please refer to our website at <http://www.supermicro.com/products/nfo/networking.cfm#adapter>.

### 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 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.

## Contacting Supermicro

### Headquarters

Address: Super Micro Computer, Inc.  
980 Rock Ave.  
San Jose, CA 95131 U.S.A.

Tel: +1 (408) 503-8000

Fax: +1 (408) 503-8008

Email: [marketing@supermicro.com](mailto:marketing@supermicro.com) (General Information)  
[support@supermicro.com](mailto:support@supermicro.com) (Technical Support)

Website: [www.supermicro.com](http://www.supermicro.com)

### Europe

Address: Super Micro Computer B.V.  
Het Sterrenbeeld 28, 5215 ML  
's-Hertogenbosch, The Netherlands

Tel: +31 (0) 73-6400390

Fax: +31 (0) 73-6416525

Email: [sales@supermicro.nl](mailto:sales@supermicro.nl) (General Information)  
[support@supermicro.nl](mailto:support@supermicro.nl) (Technical Support)  
[rma@supermicro.nl](mailto:rma@supermicro.nl) (Customer Support)

### Asia-Pacific

Address: Super Micro Computer, Inc.  
4F, No. 232-1, Liancheng Rd.  
Chung-Ho 235, Taipei County  
Taiwan, R.O.C.

Tel: +886-(2) 8226-3990

Fax: +886-(2) 8226-3991

Website: [www.supermicro.com.tw](http://www.supermicro.com.tw)

Email: [support@supermicro.com.tw](mailto:support@supermicro.com.tw) (Technical Support)

Tel: +886-(2) 8226-5990 (Technical Support)

# Table of Contents

## ***Preface***

### ***Chapter 1 Overview***

1-1	Overview .....	1-1
1-2	Product Highlights .....	1-1
1-3	Technical Specifications .....	1-1
1-4	Compliance/Operating Environment .....	1-4

### ***Chapter 2 Hardware Components***

2-1	Add-On Card Image and Layout .....	2-1
2-2	Major Components .....	2-1
2-3	Connectors: LAN Ports and LAN LED Indicators .....	2-2
	Ethernet Ports .....	2-2
	GLAN Port LEDs .....	2-2
2-4	Jumpers: 3.3V Standby .....	
	Power Jumper .....	2-3
	Explanation of Jumpers .....	2-3
	3.3V Standby Power Enable .....	2-3

### ***Chapter 3 Installation***

3-1	Static-Sensitive Devices .....	3-1
	Precautions .....	3-1
	Unpacking .....	3-1
3-2	Before Installation .....	3-2
3-3	Installing the Add-on Card .....	3-2
3-4	Installing the Windows Operating System .....	3-3
3-5	Installing the Linux Operating System .....	3-3
	Build a Binary RPM Package .....	3-3
3-6	Building the Driver Manually .....	3-4

# 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 Product Highlights

The product highlights of this add-on card include the following:

- Dual RJ45 Connectors
- Low-Profile, Short Length Standard Form Factor
- PCI Express 2.1 (2.5GT/s or 5GT/s)
- Intel® QuickData Technology
- VMDq, Next-Generation VMDq, and PC-SIG SR-IOV for Virtualized Environments
- Jumbo Frame Support up to 15.5KB
- Load Balancing on Multiple CPUs
- iSCSI Remote Boot Support

### 1-3 Technical Specifications

#### General

- Intel® X540 10GbE controller with integrated 10GBase-T copper PHYs
- Compact size low-profile standard form factor

- PCI-E x8 2.1 (2.5GT/s or 5GT/s) interface
- Dual RJ-45 connectors with speed up to 10Gb/port
- Load balancing on multiple CPUs
- Intel® PROSet Utility for Windows® Device Manager
- Maximum power consumption: about 13W

## **I/O Features**

- Intel® QuickData Technology: DMA engine that enhances data acceleration and lowers CPU usage
- Support for jumbo frames of up to 15.5KB
- 802.1q VLAN support
- Two integrated independent 10GBase-T interfaces operate at 10GBase-T (10Gb/s) and 1000Base-T (1Gb/s) modes
- Direct Cache Access (DCA) to avoid cache misses
- MSI-X support to minimize interrupt overhead and to allow load-balancing between multiple cores/CPU's
- Receives and Transmits Side Scaling for Windows environment and Scalable I/O for Linux environments

## **Performance**

- TCP/UDP Segmentation Offload
- IPv6 Support for IP/TCP and IP/UDP Receive Checksum Offload
- Supports Fibre Channel over Ethernet (FCoE)
- Low latency interrupts
- DCA support



## **Virtualization**

- Support for Virtual Machine Device Queues (VMDq and Next-generation VMDq)
- L2 Ethernet MAC address and VLAN filters
- PC-SIG SR-IOV implementation
- Advanced Packet Filtering
- VLAN support to allow creation of multiple VLAN segments

## **Manageability**

- Preboot eXecution Environment (PXE) support
- Simple Network Management Protocol (SNMP) and Remote Network Monitoring (RMON) statistics counters
- iSCSI remote boot

## **Required Cables**

- RJ-45 Category-6 up to 55m; Category-6A up to 100m.

## **OS Support**

The AOC-STG-i2T add-on card supports the following operating systems (OS):

- Windows® Vista SP2, 2003 SP2, 2008 SP2
- Linux: RedHat EL, SuSe SLES
- FreeBSD

## **Dimensions**

The AOC-STG-i2T add-on card supports both full-height and low-profile brackets. The dimensions of the card is listed below:

- 5.4 in. (13.7 cm) x 2.5 in (6.35 cm) (L x H)

## Platform Support

The following platforms are supported by the AOC-STG-i2T add-on card:

- Motherboards with minimum PCI-E x8 slot support
- Server systems with low-profile or full-height PCI-E x8 expansion slots



**Note:** This product is intended to be used with Supermicro server systems or motherboards as an integrated solution package.

## 1-4 Compliance/Operating Environment

The AOC-STG-i2T add-on card is compliant with the following environmental regulations:

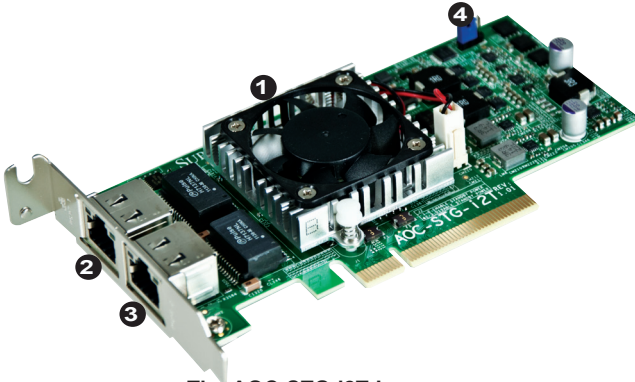
- RoHS Compliant 6/6, Pb Free



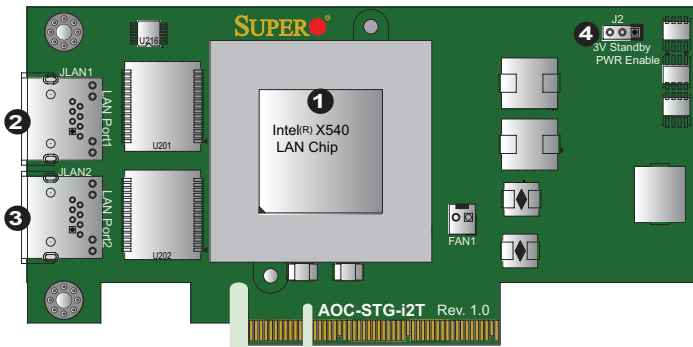
## Chapter 2

### Hardware Components

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



The AOC-STG-i2T Image



The AOC-STG-i2T Layout

#### 2-2 Major Components

The following major components are installed on the AOC-STG-i2T:

1. Intel® X540 10Gb/1Gb LAN Controller
2. (RJ45 Ethernet) LAN Port 1 & LAN1 LED Indicator
3. (RJ45 Ethernet) LAN Port 2 & LAN2 LED Indicator
4. 3.3V Standby Power Enable (Jumper)

## 2-3 Connectors: LAN Ports and LAN LED Indicators

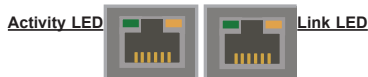
### Ethernet Ports

Two Ethernet ports (LAN1/LAN2) are located on the add-on card. These ports support connection speeds of 10Gbps and 1Gbps. Plug the RJ45 type cables into LAN Port1 and LAN Port2 to provide Ethernet connections. Refer to the add-on card layout on Page 2-1 for the locations of the LAN ports. Also, see the table on the left for LAN port pin definitions.

LAN Ports Pin Definition			
Pin#	Definition		
1	M_MDIO_P0		
2	M_MDIO_N0		
3	M_MDIO_P1	9	LINK0_10G
6	M_MDIO_N1	10	LINK0_1G
4	M_MDIO_P2	11	LINK0_LINKUP
5	M_MDIO_N2	12	LINK0_ACT_N
7	M_MDIO_P3	13	GND
8	M_MDIO_N3	14	GND

### GLAN Port LEDs

Two LAN ports (LAN 1/LAN 2) are located on the add-on card. Each Ethernet LAN port has two LEDs. The green LED on the left indicates activity; while the other LED on the right may be green, amber or Off to indicate the speeds of the connections. See the tables at right for more information.




LAN 1/LAN 2 Activity LED (Left) LED State		
Color	Status	Definition
Green	Flashing	Active

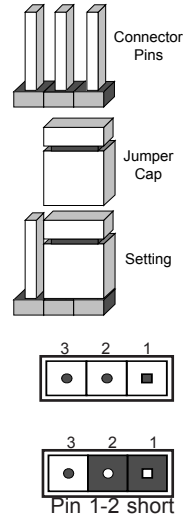
LAN 1/LAN 2 Link LED (Right) LED State	
LED Color	Definition
Green	10 Gbps
Amber	1 Gbps
Off	100 Mbps or No Connection

## 2-4 Jumpers: 3.3V Standby Power Jumper

### Explanation of Jumpers


To modify the operation of the add-on card, a jumper can be used to choose between optional settings. A jumper creates 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 add-on card layout on Page 2-1 for the jumper location.

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



### 3.3V Standby Power Enable

The 3.3V Standby Power Enable jumper is located at J2 on the add-on card. Refer to the layout on Page 2-1 for the location of the jumper. Close Pins 1 & 2 to enable 3.3V Standby Power for Wake-on-LAN support. The default setting is **Disabled**.

 **Note:** If this jumper is set to "Enabled", LAN chip overheat may occur. Be sure to provide adequate system cooling when the jumper is enabled.

3.3V Standby PWR Enable Jumper Settings	
Jumper setting	Definition
1-2	Enabled (See the note below)
2-3	<b>Disabled</b> (default)

## **Notes**

## 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, 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 your system, make sure that the person handling it is static protected.



**Note:** To avoid damaging your components and to ensure proper installation, be sure to always connect the power cord last, and always remove 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 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.

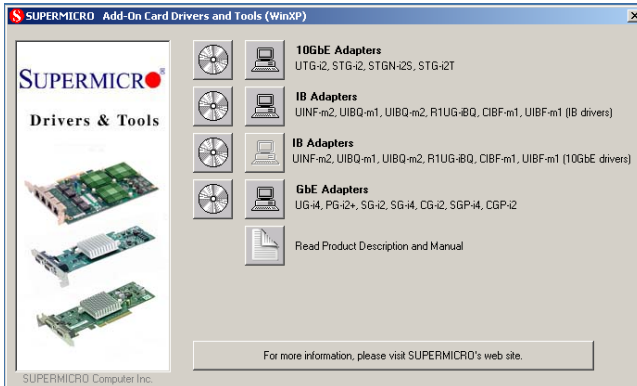
1. Remove the server cover and, if necessary, set aside any screws for later use.
2. Remove the add-on card slot cover. If the case requires a screw, place the screw aside for later use.
3. Position the add-on card in the slot directly over the connector, and gently push down on both sides of the card until it slides into the PCI connector.
4. Secure the add-on card 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 the Windows Operating System

Follow the steps below to install the drivers needed for your Windows OS support. The controller comes with a driver on the CD-ROM CDR-NIC.

1. Run the CDR-NIC. (If you do not have a product CD-ROM, download drivers from the Supermicro Support Website and then transfer them to your system.)
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 the Linux Operating System

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

## 3-6 Building the Driver Manually

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:

```
tar xzf ixgbe-x.x.x.tar.gz
```

3. Change to the driver src directory:

```
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 might 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>
```

## **Notes**

(Disclaimer Continued)

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