AOC-STGF-i2S



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, IT technicians, and knowledgeable end users. It provides information for the installation and use of the AOC-STGF-i2S add-on card.

About this Add-on Card

The Supermicro® AOC-STGF-i2S dual-port Ethernet card delivers superior performance with an industry-leading, energy-efficient design based on Intel® X710. This feature-rich card addresses the demands of the next-generation data center by providing unmatched functionality for both servers and network virtualization. It excels at small packet transfers, bulk transfers, and network virtualization overlay offloads including VXLAN, NVGRE, and Geneve. Moreover, its Supermicro Asset Management and thermal detection provide an extra layer of controller health management. AOC-STGF-i2S provides reliable performance that is required for today's networking needs, and it is an excellent choice for next generation 10GbE network.

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/RmaForm/).

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.

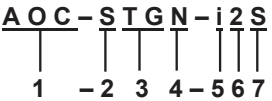
During the warranty period, contact your distributor first for any product problems.

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:

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

Naming Convention



Character	Representation	Options
1st	Product Family	AOC: Add On Card
2nd	Form Factor	S: Standard, P: Proprietary, C: MicroLP, U: UIO
3rd	Product Type/Speed	G: GbE (1Gb/s), TG: 10GbE (10Gb/s), 40G: 40GbE (40Gb/s), IBF: FDR IB (56Gb/s), IBQ: QDR IB (40Gb/s)
4th	Chipset Model (Optional)	N: Niantec (82599), P: Powerville (i350), S: Sageville (X550)
5th	Chipset Manufacturer	i: Intel, m: Mellanox, b: Broadcom
6th	Number of Ports	1: 1 port, 2: 2 ports, 4: 4 ports
7th	Connector Type (Optional)	S: SFP+, T: 10GBase-T, Q: QSFP+

SMC Networking Add-on Cards

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-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

Model	Type	Form Factor	Interface	Controller	Connection	Dimension (w/o Brackets) (L x H)	Power (W)
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® 82598EN	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-PTG-i1S	10GbE	Proprietary	PCI-E x8	Intel® 82599EN	1 SFP+ (10Gb/port)	10.04" (255mm) x .78" (20mm)	7.5
AOC-UG-i4	GbE	UIO FH	PCI-E x8	Intel® 82571EB	4 RJ45 (1Gb/port)	6.6" (167mm) x 3.9" (98mm)	10
AOC-CGP-i2	GbE	MicroLP	PCI-E x4	Intel® i350 AM2	2 RJ45 (1Gb/port)	4.45" (113mm) x 1.54" (39mm)	4
AOC-CG-i2	GbE	MicroLP	PCI-E x4	Intel® 82580	2 RJ45 (1Gb/port)	4.45" (113mm) x 1.3" (34mm)	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 Product Highlights

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

- Dual SFP+ connectors
- Low-Profile, short length standard form factor
- PCI-E 3.0 x8
- Intel® X710 controller
- Asset Management features with thermal sensor
- VXLAN and NVGRE
- Intel® flow director
- VMDq, SR-IOV for virtualization environment
- Jumbo Frames support up to 9.6KB
- NC-SI for IPMI support
- RoHS compliant 6/6

1-3 Technical Specifications

General

- Intel® X710 10GbE controller
- Compact size low-profile standard form factor
- PCI-E 3.0 x8
- Dual SFP+ connectors
- 10Gbps per port

I/O Features

- Intel® flow director
- 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
- TCP segmentation/large send offload
- Interrupt moderation
- Jumbo frame support (9.6KB)

Virtualization Features

- Next-Generation VMDq with up to 256 VMDq VMs supported
- SR-IOV with up to 128 virtual ports
- Virtual Machine Load Balancing (VMLB)
- Advanced packet filtering
- VXLAN and NVGRE support

Storage Interface Features

- Preboot eXecution Environment (PXE) support
- iSCSI remote boot

Management Features

- Asset Management features with thermal sensors
- NC-SI for IPMI support

Advanced Software Features

- Teaming support
- IEEE 802.3-2008
- IEEE 802.3ba-2010
- IEEE 802.1Qbb-2011
- IEEE 802.1Qaz-2011
- IEEE 802.1Qbg-2012
- IEEE 802.1AX-2008
- IEEE 802.1AB-2009
- IEEE 802.3ad (link aggregation control protocol)
- IEEE 802.1Q-2011
- IEEE 802.3 2005 flow control support
- IEEE 802.1p
- IEEE 1588-2009

Power Consumption

- Typical: 5.63W

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: 13.19cm x 6.89cm (5.19in x 2.71in)
- Height of end brackets: standard – 12cm (4.725in), low-profile – 7.94cm (3.13in))

Weight

- 184.5g (0.4068lb)

Supported Platforms

- Supermicro® motherboards with minimum PCI-E x8 expansion slot
- Supermicro® server systems with low-profile or full-height PCI-E x8 expansion slot
- NC-SI feature is only supported by Supermicro motherboards with corresponding NC-SI connectors



Note: Please note that these products are sold only as part of integrated solutions with Supermicro server systems.

1-4 Compliance/Operating Environment

- RoHS Compliant 6/6, Pb Free

1-5 Operating System/Architecture Support

Operating System	IA-32	X86-64	IA-64
Windows Server 2012R2		X	
Windows Server 2012R2 Core		X	
Windows Server 2012		X	
Windows Server 2012Core		X	
Windows Server 2008 R2		X	
Windows Server 2008 R2Core		X	
Linux Stable Kernel Version 2.6.32/3x	X	X	X

Operating System	IA-32	X86-64	IA-64
Linux RHEL 6.5 and RHEL 7.0	X	X	X
Linux SLES 11 SP3 and SLES 12	X	X	X
FreeBSD 9 and FreeBSD 10	X	X	X
UEFI 2.1		X	X
UEFI 2.3		X	X
VMware ESXi5.1		X	
VMware ESXi5.5		X	

1-6 Optional Parts List

	Part Number	Description
SFP+Copper Cable	CBL-NTWK-0347	10 GbE SFP+ to SFP+, Passive,30AWG,Pull Type,1M
SFP+Copper Cable	CBL-NTWK-0456	10 GbE SFP+ to SFP+, Passive,30AWG,Pull Type,2M
SFP+Copper Cable	CBL-0348L	10 GbE SFP+ to SFP+, Passive,24AWG,Pull Release,3M
SFP+Copper Cable	CBL-0349L	10 GbE SFP+ to SFP+, Passive,24AWG,Pull Release,5M
SFP+Transceiver Module	AOM-TSFP-709DMZ-AVG	SFP+ transceiver module 10GBASE-SR,10G/1G,850nm,MMF,LC
SFP+Transceiver Module	AOM-TSR-FS	SFP+ transceiver module for short range fiber cables (up to 400m/OM4), 10G/1G,850nm,MMF,LC

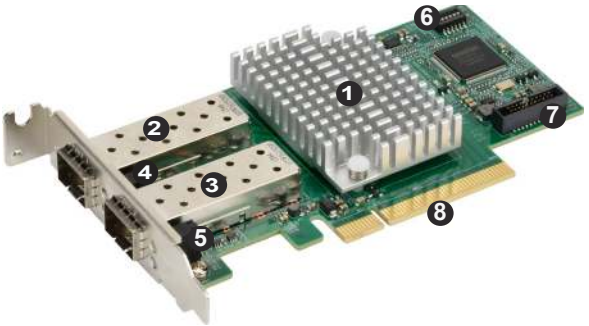
1-7 Similar Products

Product Part Number	Form Factor	Speed	PCI-E	Connector Type	Total Parts	Chipset
AOC-STG-i4S	Standard Low Profile	10GbE	PCI-E 3.0 x8	SFP+	4	Intel®XL710
AOC-STG-b4S	Standard Low Profile	10GbE	PCI-E 3.0 x8	SFP+	4	QLogic®BCM57840
AOC-STGN-i1S	Standard Low Profile	10GbE	PCI-E 2.0 x8	SFP+	1	Intel®82599EN
AOC-STGN-i2S	Standard Low Profile	10GbE	PCI-E 2.0 x8	SFP+	2	Intel®82599ES
AOC-STG-i2T	Standard Low Profile	10GbE	PCI-E 2.1 x8	RJ45	2	Intel®X540
AOC-STGS-i2T	Standard Low Profile	10GbE	PCI-E 3.0 x4	RJ45	2	Intel®X550
AOC-STGS-i1T	Standard Low Profile	10GbE	PCI-E 3.0 x4	RJ45	1	Intel®X550
AOC-STG-i4T	Standard Low Profile	10GbE	PCI-E 3.0 x8	RJ45	4	Intel®XL710
AOC-S25G-m2S	Standard Low Profile	25GbE	PCI-E 3.0 x8	SFP28	2	Mellanox®CX-4 Lx En

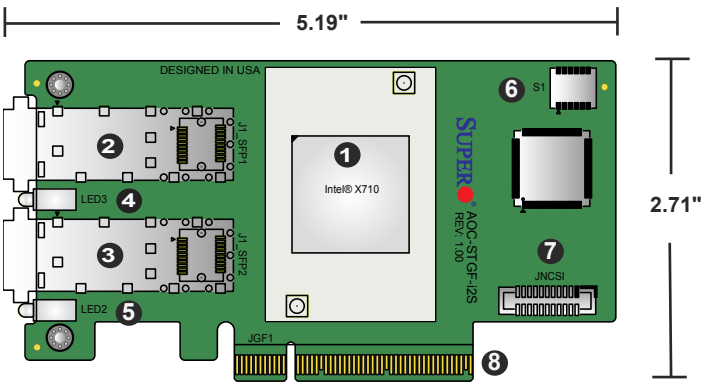
Chapter 2

Hardware Components

2-1 Add-On Card Image and Layout



The AOC-STGF-i2S R1.00 Image



The AOC-STGF-i2S R1.00 Layout

1. Intel® X710 controller	5. SFP+ Port2 LED
2. SFP+ Port1	6. DIP Switch
3. SFP+ Port2	7. NC-SI Header
4. SFP+ Port1 LED	8. PCI-E 3.0 x8

2-2 Major Components

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

1. Intel® X710 controller
2. SFP+ LAN Ports 1/2
3. SFP+ Port1 LED
4. SFP+ Port2 LED
5. NC-SI for IPMI support
6. DIP switch

2-3 SFP+ Ethernet Connections

SFP+ (Port1/Port2) Connectors

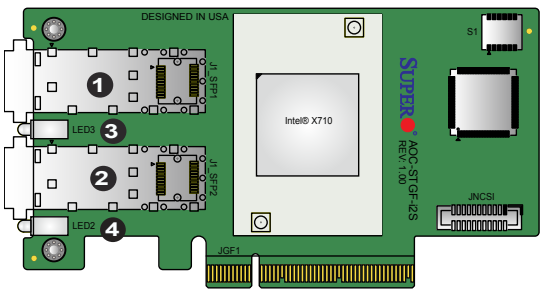
Two SFP+ optical transceiver connectors (J1_SFP1/J1_SFP2) are located on the add-on card. These SFP+ ports provide Ethernet 10GbE network connections. See the layout below for the locations.

SFP+ (Port1/Port2) Link/Activity LED Indicators

Two LAN Link/Activity LED indicators are located at LED2 and LED3 on the add-on card. LED2/LED3 are used for the SFP+ Port1/Port2 connectors respectively. See the table and layout below for the LED states and locations.

LAN Port Activity LED Indicators LED2/LED3 Assignment/State	
LED Color	Definition
Blinking Green	SFP+ Active

LAN Port Link LEDs (LED2/LED3) LED State	
LED Color	Definition
Amber	1 GbE
Green	10 GbE



1. SFP+ Port 1
2. SFP+ Port 2
3. SFP+ Port1 LED
4. SFP+ Port2 LED

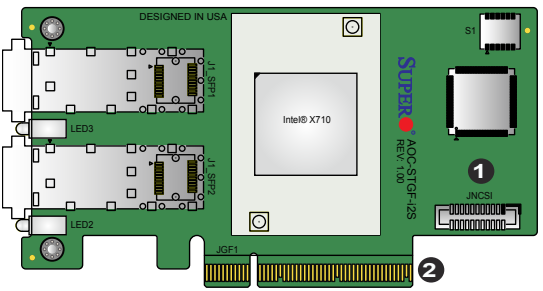
2-4 NC-SI Header & PCI-E 3.0 x8 Golden Finger

NC-SI Header

A Network-Controller Sideband Interface (NC-SI) header is located at JNCSI 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 NC-SI 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.

PCI-E 3.0 x8 Golden Finger

A PCI-E 3.0 x8 Golden Finger is located at JGF1 on the add-on card. Insert this connector into a PCI-E 3.0 x8 slot on a motherboard to use the AOC-STGF-i2S add-on card. See the layout below for the location.

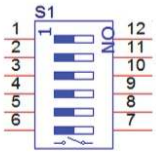


1. NC-SI Header
2. PCI-E 3.0 x8 Golden Finger

2-5 DIP Switch

DIP Switch

The DIP Switch at S1 provides SMBUS address selection. You can configure the card with static SMBUS address. Refer to the tables below for address selections. See the layout below for the location.

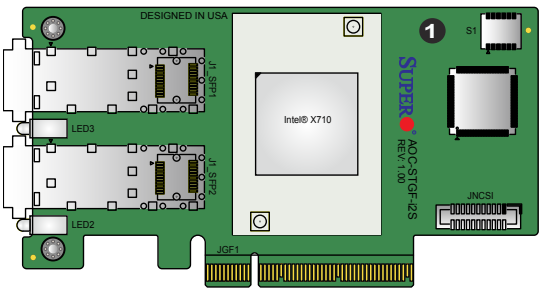


S1:DIP switch for user selection

Switch Position	OFF (default)	ON
1	SMBUS ARP mode	Static SMBUS address mode
2~5	Static SMBUS address selection	
6	Thermal Reading Enable	Thermal Reading Disable

Static SMBUS address selection table by DIP switch S1

SMBUS Address	S1 position #5	S1 position #4	S1 position #3	S1 position #2
30/D0	OFF/ON	OFF	OFF	OFF
32/D2	OFF/ON	OFF	OFF	ON
34/D4	OFF/ON	OFF	ON	OFF
36/D6	OFF/ON	OFF	ON	ON
38/D8	OFF/ON	ON	OFF	OFF
3A/DA	OFF/ON	ON	OFF	ON
3C/DC	OFF/ON	ON	ON	OFF
3E/DE	OFF/ON	ON	ON	ON



1. DIP Switch

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 system, make sure that you are 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. Unplug the power cord.
3. Use industry standard anti-static equipment (such as gloves or 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.

3-3 Installing the Add-on Card

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

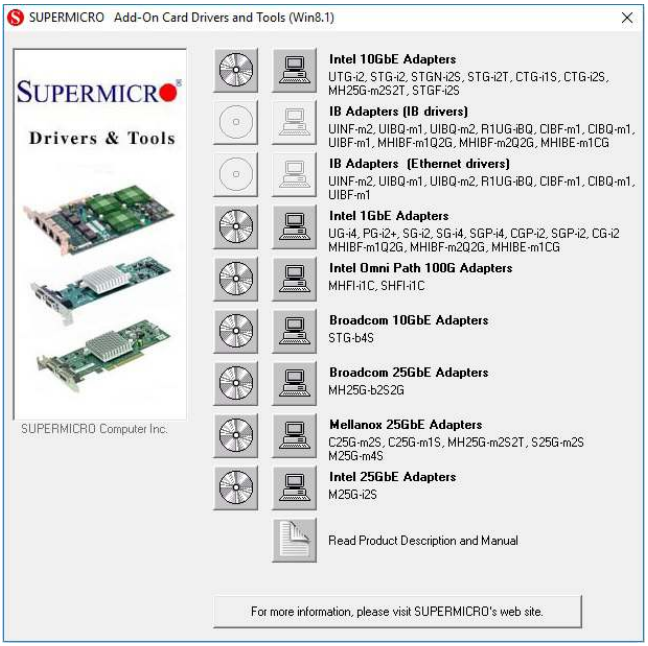
1. Remove the server cover and, if any, set aside any screws for later use.
2. Remove the add-on card slot cover. If the case requires a screw, place the screw aside for later use.
3. Position the add-on card in the slot directly over the connector, and gently push down on both sides of the card until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

Follow the steps below to install the drivers for Windows. Download the drivers from the Supermicro site at https://www.supermicro.com/wftp/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 Drivers on Linux

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

Build a Binary RPM Package

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

5. 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.

Move the base driver tar file to the directory of your choice. For example, `/home/username/ixgbe`

or

`/usr/local/src/ixgbe.`

6. Untar/unzip archive:

```
tar xvzf ixgbe-x.x.x.tar.gz
```

7. Change to the driver src directory:

```
cd ixgbe-x.x.x/src/
```

8. 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
```

9. 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
   ```

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

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

11. 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

Follow the instructions below to install the drivers in 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.

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

12. Untar/unzip the archive:

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

13. To install man page:

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

14. 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
```

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

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

16. 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>
```

17. 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"
```

18. 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 Asset Management Features

Asset Management is a new feature that allows users to monitor selected Supermicro add-on cards in selected Supermicro X10 generation server systems. Using Supermicro's proprietary management software, users will be able to monitor the following:

1. Model name
2. Revision
3. Serial number
4. Temperature