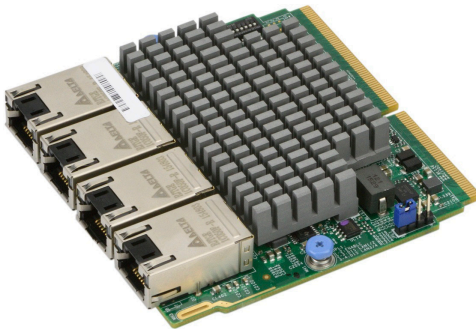




AOC-MTG-i2T



AOC-MTG-i4T



User's Guide

Revision 1.0b

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User's Guide Revision 1.0b

Release Date: March 4, 2019

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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-MTG-i2T/i4T add-on card.

About this Add-on Card

The Supermicro AOC-MTG-i4T and AOC-MTG-i2T are the most feature rich low power 10GBase-T controllers in the market today. Based on the Intel® X550 chipset with virtualization features such as VXLAN and NVGRE, it offers flexible connectivity selection for all networking requirements. The second generation integrated 10GbE MAC+PHY drives down both cost and power enabling a highly cost effective deployment of 10GbE in the data center. The AOC-MTG-i4T and AOC-MTG-i2T are among the most innovative 10GbE controllers in the market and an excellent choice to expand 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 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/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:



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



Character	Representation	Options
1st	Product Family	AOC: Add On Card
2nd	Form Factor	S: Standard, P: Proprietary, C: MicroLP, M: Super IO Module (SIOM), MH: SIOM Hybrid
3rd	Product Type/Speed	G: GbE (1Gb/s), TG: 10GbE (10Gb/s), 25G: 25GbE (25Gb/s), 40G: 40GbE (40Gb/s), 50G: 50GbE (50Gb/s), 100G: 100GbE (100Gb/s), IBE: EDR IB (100Gb/s), IBF: FDR IB (56Gb/s), IBQ: QDR IB (40Gb/s), HFI: Host Fabric Interface
4th	Chipset Model (Optional)	N: Niantec (82599), P: Powerville (i350), S: Sageville (X550)
5th	Chipset Manufacturer (Optional)	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+SFP28, T: 10GBase-T, Q: QSFP+, C: QSFP28
8th	2 nd Controller/Connector Type (Optional)	G: GbE RJ45, S: 10G SFP+, T: 10GBase-T

SMC Networking Add-on Cards

Model	Type	Form Factor	Controller	Connection	Dimension (w/o Brackets) (L x H)	Power (W)
SGP-i2	GbE	Standard LP	Intel® i350 AM2	2 RJ45 (1Gb/port)	3.9" (99mm) x 2.73" (69mm)	3.5
SGP-i4	GbE	Standard LP	Intel® i350 AM4	4 RJ45 (1Gb/port)	3.9" (99mm) x 2.73" (69mm)	5
STG-b4S	10GbE	Standard LP	Broadcom® BCM57840S	4 SFP+ (10Gb/port)	5.4" (137mm) x 2.73" (69mm)	14
STG-i2T	10GbE	Standard LP	Intel® X540-AT2	2 RJ45 (10GBase-T)	5.9" (150mm) x 2.73" (69mm)	13
STGN-i2S	10GbE	Standard LP	Intel® 82599ES	2 SFP+ (10Gb/port)	4.0" (102mm) x 2.73" (69mm)	11.2
STGN-i1S	10GbE	Standard LP	Intel® 82598EN	1 SFP+ (10Gb/port)	4.0" (102mm) x 2.73" (69mm)	10
STG-i4S	10GbE	Standard LP	Intel® XL710-AM1	4 SFP+ (10Gb/port)	5.9" (150mm) x 2.73" (69mm)	8
S40G-i2Q	40GbE	Standard LP	Intel® XL710 AM2	2 QSFP+ (40Gb/port)	5.9" (150mm) x 2.73" (69mm)	7
PTG-i1S	10GbE	Proprietary	Intel® 82599EN	1 SFP+ (10Gb/port)	10.04" (255mm) x .78" (20mm)	7.5
UG-i4	GbE	UIO FH	Intel® 82571EB	4 RJ45 (1Gb/port)	6.6" (167mm) x 3.9" (98mm)	10
CGP-i2	GbE	MicroLP	Intel® i350 AM2	2 RJ45 (1Gb/port)	4.45" (113mm) x 1.54" (39mm)	4
CG-i2	GbE	MicroLP	Intel® 82580	2 RJ45 (1Gb/port)	4.45" (113mm) x 1.3" (34mm)	4
CIBF-m1	FDR IB	MicroLP	Mellanox® ConnectX-3	1 QSFP (56Gb/port)	4.85" (123mm) x 1.54" (39mm)	7
CIBQ-m1	QDR IB	MicroLP	Mellanox® ConnectX-3	1 QSFP (40Gb/port)	4.85" (123mm) x 1.54" (39mm)	7
CTG-i1S	10GbE	MicroLP	Intel® 82599EN	1 SFP+ (10Gb/port)	4.85" (123mm) x 1.54" (39mm)	10
CTG-i2S	10GbE	MicroLP	Intel® 82599ES	2 SFP+ (10Gb/port)	4.85" (123mm) x 1.54" (39mm)	11
CTG-i2T	10GbE	MicroLP	Intel® X540	2 RJ45 (10GBase-T)	4.8" (123mm) x 2.75" (77mm)	13
CTGS-i2T	10GbE	MicroLP	Intel® X550	2 RJ45 (10GBase-T)	4.45" (113mm) x 1.54" (39mm)	12
MGP-i2	GbE	SIOM	Intel® i350 AM2	2 RJ45 (1Gb/port)	3.622" (92mm) x 3.428" (87.1mm)	3.7
MGP-i4	GbE	SIOM	Intel® i350 AM4	4 RJ45 (1Gb/port)	3.622" (92mm) x 3.428" (87.1mm)	4.4
MTGN-i2S	10GbE	SIOM	Intel® 82599ES	2 SFP+ (10Gb/port)	3.622" (92mm) x 3.428" (87.1mm)	7.2
MTG-i4S	10GbE	SIOM	Intel® XL710-AM1	4 SFP+ (10Gb/port)	3.622" (92mm) x 3.428" (87.1mm)	7
MTG-i2T	10GbE	SIOM	Intel® X550	2 RJ45 (10GBase-T)	3.622" (92mm) x 3.428" (87.1mm)	13
MTG-i4T	10GbE	SIOM	Intel® X550	4 RJ45 (10GBase-T)	3.622" (92mm) x 3.428" (87.1mm)	26

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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/info/networking.cfm#adapter>.

1-2 Key Features

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

- Super IO Module (SIOM) Form Factor
- Intel® X550 10GbE controller
- Quad and Dual RJ45 Connectors
- Network Virtualization Offloads: VXLAN and NVGRE
- VMDq and SR-IOV for virtualized Environment
- Asset Management Features with thermal sensor
- NC-SI for Remote Management
 - AOC-MTG-i4T has two controllers that are in reversed order. If you are intent to use NC-SI feature on this card, please note that your NC-SI port is assigned to LAN 3. If you wish to learn more about IPMI setup, please refer to this document: https://www.supermicro.com/manuals/other/IPMI_Users_Guide.pdf.
- Supports RJ-45 Category-6 and 6A cables
- RoHS compliant 6/6

1-3 Specifications

General

- Intel® X550 10GbE controller with integrated 10GBase-T copper PHYs
- Super I/O Module (SIOM) Form Factor
- Quad and dual RJ45 ports

I/O Features

- MSI/MSI-X support
- Low Latency
- Multiple Queues – 64 Tx and Rx Per Port
- Tx/Rx IP, SCTP, TCP, and UDP Checksum Offloading (IPv4, IPv6) Capabilities
- Tx TCP Segmentation Offload (IPv4, IPv6)
- Receive and Transmit Side Scaling for Windows Environment and Scalable I/O for Linux Environments (IPv4, IPv6 and TCP/ UDP)

Virtualization Features

- Network Virtualization Stateless Offload: VXLAN, NVGRE
- Support for Virtual Machine Device Queues (VMDq)
- 64 Transmit (Tx) and Receive (Rx) Queue Pairs Per Port
- FPP – 64 VFs per Port
- PCI-SIG SR-IOV
- 802.1q VLAN support

Manageability Features

- Preboot eXecution Environment (PXE) support
- Remote Boot iSCSI and FCoE
- EEEE 1588
- Asset Management support on Supermicro® platforms
- NC-SI for Remote Management on Supermicro® platforms

Cables Support

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

Power Consumption

- AOC-MTG-i4T: Typical 22W, Maximum 26W
- AOC-MTG-i2T: Typical 11W, Maximum 13W

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)

Compliance/Environmental

- RoHS Compliant 6/6, Pb Free

Supported Platforms

- Supermicro[®] motherboards with Super I/O Module slot
- Supermicro[®] server systems with Super I/O Module slot (See SIOM Compatibility Matrix online)

http://www.supermicro.com/support/resources/AOC/AOC_Compatibility_SIOM.cfm

Supported Operating Systems

Operating System	IA32	X64	IPF
Windows [®] 7 SP1		X	
Windows 8, 8.1		X	
Windows 10		X	
Windows Server 2008 R2		X	
Windows 2012, 2012 R2		X	
Windows PE 3.0 (2008 R2 PE)	X	X	
Windows PE 4.0 (2012 PE)	X	X	
Windows PE 5.0 (2023 R2 PE)	X	X	
Linux Stable Kernel Version 2.6/3.x/4.x	X	X	X
Linux RHEL 6.7/7.1	X	X	
Linux SLES 11 SP4	X	X	X
Linux SLES 12	X	X	
FreeBSD 10.2	X	X	
UEFI 2.1/2.3		X	X
UEFI 2.4		X	
VMWare ESXi 5.5/6.0		X	

Optional Accessories

- CBL-NTWK-0603, RJ45 CAT6A 550MHz Rated Blue 3 ft. patch cable
- CBL-NTWK-0603, RJ45 CAT6A 550MHz Rated Blue 5 ft. patch cable
- CBL-NTWK-0603, RJ45 CAT6A 550MHz Rated Blue 6 ft. patch cable
- CBL-NTWK-0603, RJ45 CAT6A 550MHz Rated Blue 9 ft. patch cable
- CBL-NTWK-0603, RJ45 CAT6A 550MHz Rated Blue 10 ft. patch cable
- CBL-NTWK-0603, RJ45 CAT6A 550MHz Rated Blue 12 ft. patch cable
- CBL-NTWK-0603, RJ45 CAT6A 550MHz Rated Blue 15 ft. patch cable
- CBL-NTWK-0603, RJ45 CAT6A 550MHz Rated Blue 18 ft. patch cable
- CBL-NTWK-0603, RJ45 CAT6A 550MHz Rated Blue 21 ft. patch cable
- CBL-NTWK-0603, RJ45 CAT6A 550MHz Rated Blue 24 ft. patch cable

Available SKUs

SKUs	Part Number	Qty	Description
AOC-MTG-i4T	AOC-MTG-i4T	1	4-port 10 Gigabit Ethernet Adapter
	BKT-0088L	1	Swappable bracket for 2U+ chassis
AOC-MTG-i4TM	AOC-MTG-i4TM	1	4-port 10 Gigabit Ethernet Adapter
	BKT-0087L	1	Internal bracket
AOC-MTG-i2T	AOC-MTG-i2T	1	2-port 10 Gigabit Ethernet Adapter
	BKT-0086L	1	Swappable bracket for 2U+ chassis
AOC-MTG-i2TM	AOC-MTG-i2TM	1	2-port 10 Gigabit Ethernet Adapter
	BKT-0085L	1	Internal bracket

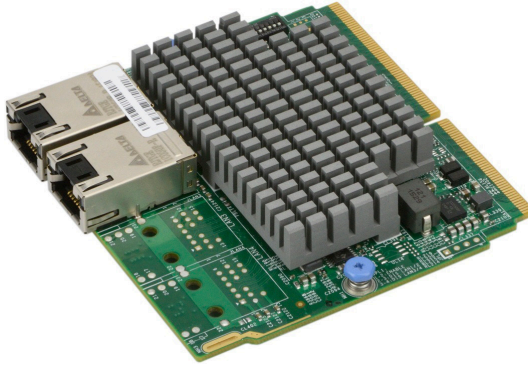
Similar Products

Product Part Number	Form Factor	Speed	Connector Type	Total Ports	Controller
AOC-MGP-i2	SIOM	1GbE	RJ45	2	Intel i350
AOC-MGP-i4	SIOM	1GbE	RJ45	4	Intel i350
AOC-MTGN-i2S	SIOM	10GbE	SFP+	2	Intel 82599
AOC-MTG-i4S	SIOM	10GbE	SFP+	4	Intel XL710

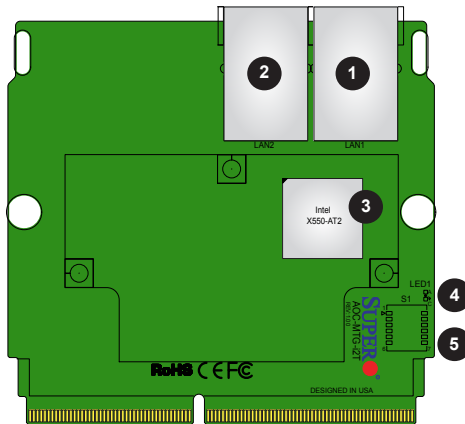
Chapter 2

Hardware Components

2-1 Add-On Card Image and Layout

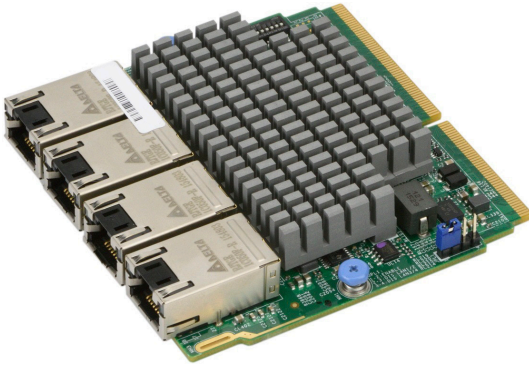


The AOC-MTG-i2T Image

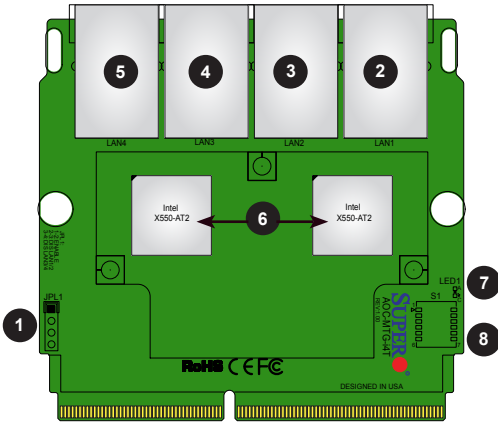


The AOC-MTG-i2T Layout

1. RJ45 LAN Port 1	4. LED1
2. RJ45 LAN Port 2	5. S1 - DIP Switch
3. Intel X550-AT2	



The AOC-MTG-i4T Image



The AOC-MTG-i4T Layout

1. JPL1	5. RJ45 LAN Port 4
2. RJ45 LAN Port 1	6. Intel X550-AT2
3. RJ45 LAN Port 2	7. LED1
4. RJ45 LAN Port 3	8. S1 - DIP Switch

2-2 Major Components

The following components are on the AOC-MTG-i2T:

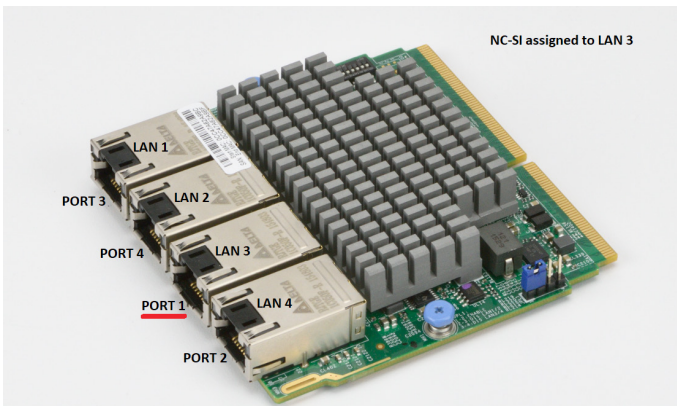
1. RJ45 LAN port 1
2. RJ45 LAN port 2
3. Intel X550-AT2 10GbE Controller
4. LED1 - Overheat LED
5. S1 - DIP Switch

The following components are on the AOC-MTG-i4T:

1. JPL1
2. RJ45 LAN Port 1
3. RJ45 LAN Port 2
4. RJ45 LAN Port 3
5. RJ45 LAN Port 4
6. Intel X550-AT2 10GbE Controller
7. LED1 - Overheat LED
8. S1 - DIP Switch



Note: Port 1 is assigned to LAN 3. PXE detection sequence starts from silkscreen LAN 3 to LAN 4 to LAN 1 and then to LAN 2.



2-3 LAN Ports and LAN LED Indicators

LAN Ports

There are two LAN ports on the AOC-MTG-i2T and four LAN ports on the AOC-MTG-i4T. These LAN ports support connection speeds of 10Gbps. Use a direct-attach RJ45 type LAN cable.



Note: Please refer to "Optional Accessories" on page 1-4 for recommended cables.



The AOC-MTG-i2T Image



The AOC-MTG-i4T Image

LAN Port LED Indicators

Each LAN port has two LEDs to indicate speed and data activity. Refer to the table below for LED color and definition.

Link LED



Activity LED

LAN Port Link LED (Left) LED State	
LED Color	Definition
Green	10 Gbps
Amber	1 Gbps
Off	100 Mbps

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

2-4 Jumpers and Connectors

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 pages 2-1 and 2-2 for the jumper location.



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

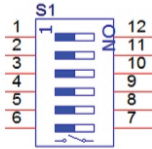
LAN Port Enable/Disable

Use jumper JPL1 to enable or disable LAN ports 1, 2, 3, and 4 on the AOC-MTG-i4T. See the table below for jumper settings. The default setting is Enabled.

AOC-MTG-i4T LAN Port Enable/Disable Jumper Settings	
Jumper setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disable LAN1/2
Pins 3-4	Disable LAN3/4

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. Refer to page 2-1 and 2-2 for the location of the switch.



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

Overheat LED

An overheat LED at LED1 displays a warning if the add-on card is overheating. See the table below for the LED status.

Overheat LED Status	
State	Definition
Solid	Overheat

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.
- 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.

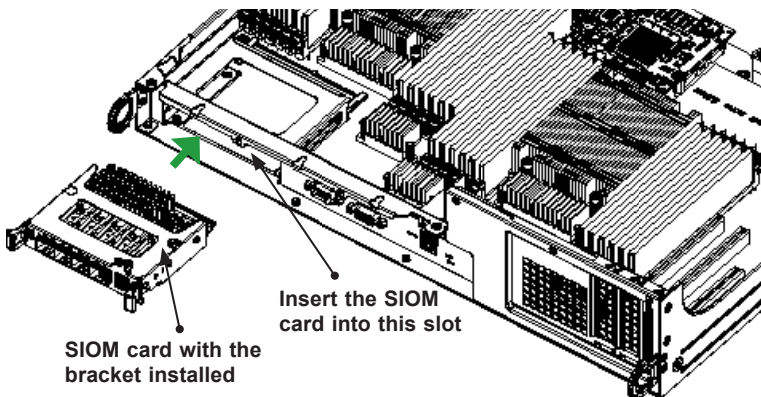
1. Power down the system.
2. Unplug the power cord.
3. Use industry-standard anti-static equipment such as gloves or a wrist strap and follow the precautions on page 3-1 to avoid damage caused by ESD.
4. Familiarize yourself with the server, motherboard, and/or chassis documentation.
5. Confirm that your operating system includes the latest updates and hotfixes.

3-3 Installing the Add-on Card

3-3-1 AOC-MTG-i4T and AOC-MTG-i2T

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 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.

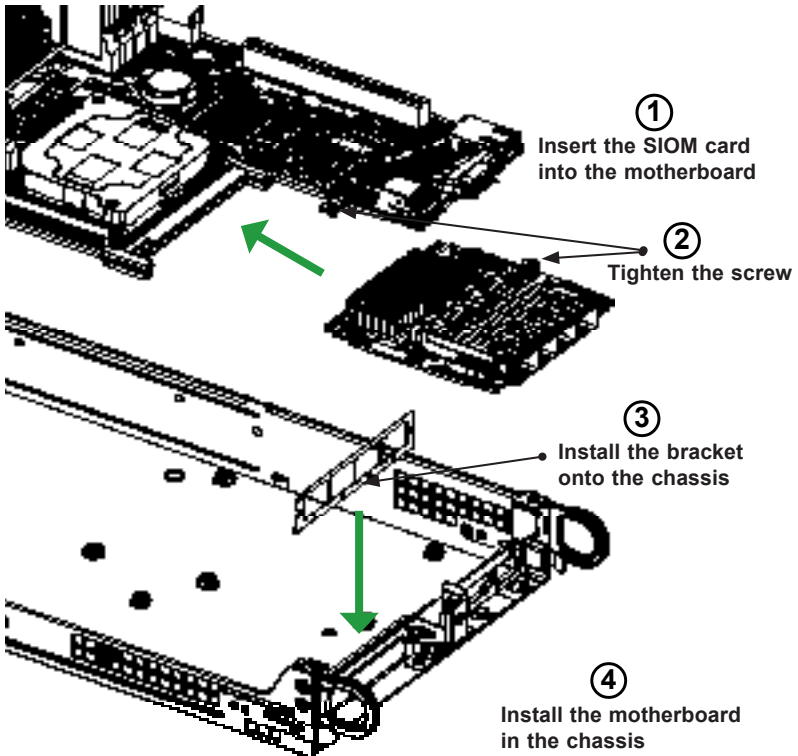


Note: This add-on card does not support hot plug. Please turn off the AC power and remove the power cord from the wall socket before you install or remove the add-on card.

4. Secure the add-on card to the chassis. If required, use the screw that you previously removed.
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.

3-3-2 AOC-MTG-i4TM and AOC-MTG-i2TM Internal

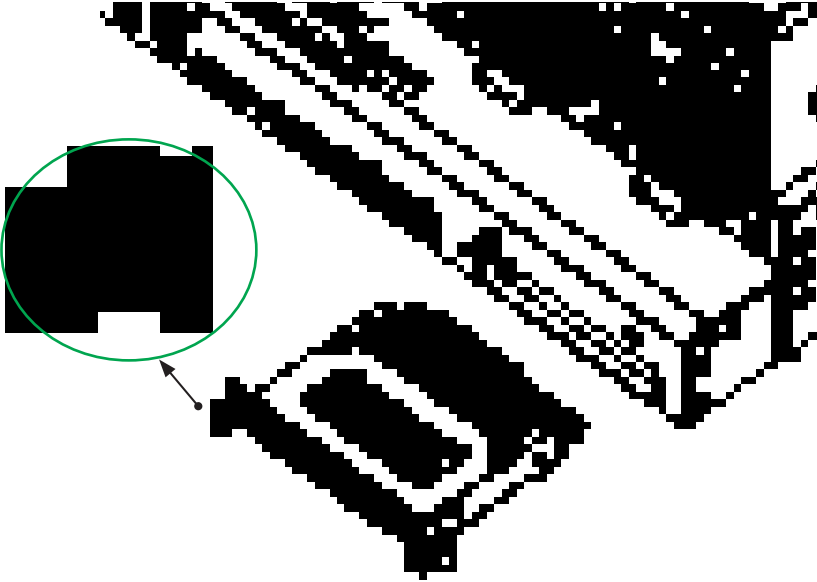
Follow this step to install the add-on card if your system does not support a swappable bracket. Insert the SIOM card in the motherboard and then install the motherboard in the chassis. An internal bracket comes with the SIOM card 1U chassis SKU. It needs to be installed onto the chassis.



Note: It is recommended that the SIOM card installation above be completed by a system integrator or the manufacturer.

AOC-MTG-i4TM and AOC-MTG-i2TM Swappable Bracket

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 the 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.

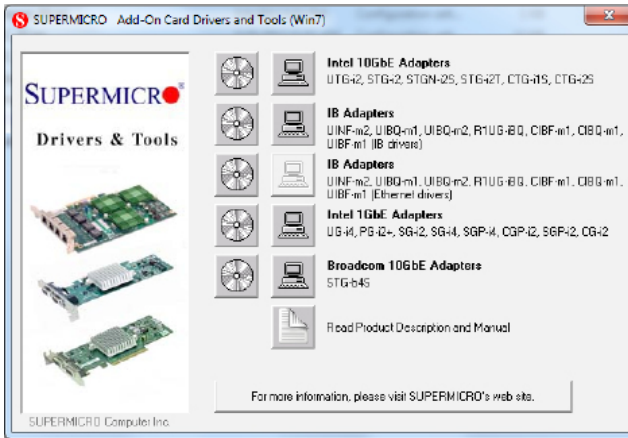
3-4 Installing Drivers on Windows

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

1. Run 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 drivers for Linux.

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.

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, where <x.x.x> is the version number for the driver tar file:

```
tar xzf 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. 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>
```

3-6 Installing Drivers on FreeBSD

Follow the instructions below to install the drivers for 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.

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 man 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. 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>
```

7. 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"
```

8. 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.

Notes

(Disclaimer Continued)

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