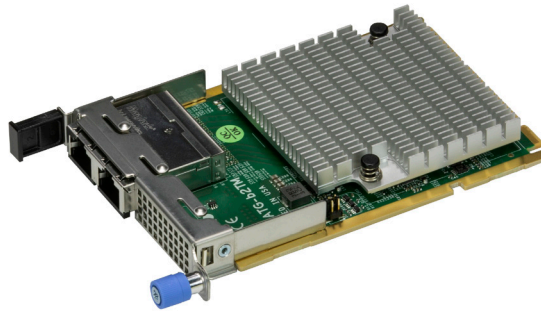
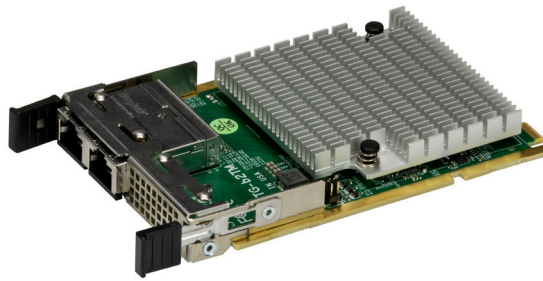
AOC-ATG-b2TM



AOC-ATG-b2TG



User's Guide

Revision 1.0a

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User's Guide Revision 1.0a

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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-ATG-b2TM and AOC-ATG-b2TG add-on card.

About this Add-on Card

Broadcom® NetXtreme E-Series Supermicro AOC-ATG-b2TM and AOC-ATG-b2TG feature the latest Broadcom® NetXtreme BCM57416 Ethernet controller. Supported by Supermicro® 10G Base-T Ethernet Adapter, these add-on cards also feature VXLAN, NVGRE, and Geneve along with Broadcom® TruFlow technology that enables users to reduce the CPU load and increase the VM density. Additionally, the auto-negotiation feature offers users backward compatibility between 1GbE and 10GbE while the included NPAR (NIC Partitioning) technology provides flexible connectivity for different networking requirements. With all these features, AOC-ATG-b2TM and AOC-ATG-b2TG are truly exceptional 10GbE Ethernet adapters for your continuously growing cloud scale and data center applications.

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.

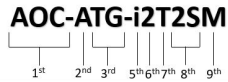
During the warranty period, contact your distributor first for any product problems.

Conventions Used in the User's Guide

Pay special attention to the following symbols for proper system installation and for safety instructions to prevent damage to the system or injury to yourself.

Note: Additional information given for proper system setup.

Naming Convention for Standard Network Adapters



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 A: Advanced IO Module (AIOM), AH: AIOM 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), HFI: Host Fabric Interface
4th	Chipset Model (Optional)	N: Niantec (82599), P: Powerville (i350), S: Sageville (X550), F: Fortville (XL710/X710), 7: ConnectX-7
5th	Chipset Manufacturer	i: Intel, m: Mellanox, b: Broadcom
6th	Number of Ports	1: 1 port, 2: 2 ports, 4: 4 ports, 8: 8 ports
7th	Connector Type (Optional)	S: SFP/SFP+/SFP28, T: 10GBase-T, Q: QSFP+, C: QSFP28/QSFP56
8th	2nd Controller/Connector Type (Optional)	G: 1x GbE RJ45, 2G: GbE 2x RJ45, S: 1x 10G SFP+, T: 10GBase-T, 2T: 2x 10GBase-T, 2S: 2x SFP+
9th	Bracket	**For AIOM – None:** 1U height bracket for Edge systems only, **B:** 0.5U height bracket (internal lock) for Blade systems only, **G:** 0.5U height for Grand Twin Front IO, **M:** 0.5U height bracket (Pull Tab) for all other systems.

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Table of Contents

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

- Advanced I/O Module (AIOM) form factor
- Broadcom® BCM57416 Ethernet controller
- Dual RJ45 Connectors
- PCI-E 3.0 x8 interface
- Asset Management Features with thermal sensor
- Broadcom® Dual-Port 10Gbps
- Pass-through Energy Efficient Ethernet (IEEE STD 802.3az-2010)
- Broadcom® TruFlow
- NPAR (NIC Partitioning)
- VXLAN, NVGRE, and Geneve
- Low latency RDMA over Converged Ethernet (RoCE)
- SR-iOV, VMQueue, NetQueue, and Multiqueue
- Jumbo frames (up to 9600-byte)

1-3 Technical Specifications

General

- Broadcom® BCM57416 dual-port 10Gbps controller
- PCI-E 3.0 x8 (8GT/s) interface
- Dual RJ45 connectors
- Broadcom® TruFlow technology

Host Interface

- PCI-E 3.0 (8GT/s)
- MCTP over SMBus
- Function Level Rest (FLR) support
- Message Signal Interrupt (MSI-X)

Networking Features

- Jumbo Frames (up to 9600-byte)
- 802.3x flow control
- Link Aggregation (802.3ad)
- Virtual LANs 802.1q VLAN tagging
- Configurable Flow Acceleration
- IEEE 1588 and Time Sync
- RDMA over Converged Ethernet (RoCE)

Stateless Offload Features

- TCP, UDP, IPv4, IPv6 checksum offload
- Large Send Offload (LSO)
- Receive Segment Coalescing (RSC)
- TCP Segmentation Offload (TSO)
- Large Receive Offload (LRO)
- Receive Side Scaling (RSS)
- Transmit Side Scaling (TSS)

NIC Partitioning (NPAR)

- 16 physical functions
- QoS per partition
- Partitioning control via sideband communication
- Up to 64MAC/VLAN filter per partition
- Stateless offload configuration per partition
- VEB/VEPA support

Flow Processing

- Exact/Wildcard Match Flow Lookup
- VLAN insertion/deletion
- NAT/NAPT
- Mirroring

Virtualization Features

- NetQueue, VMQueue, and Multiqueue
- Support for 128 Virtual Functions
- VXLAN
- NVGRE
- Geneve
- Edge Virtual Bridging (EVB)

Data Center Bridging

- Priority-based Flow Control (PFC; IEEE 802.1Qbb)
- Enhanced Transmission Selection (ETS; IEEE802.1Qau)
- Quantized Congestion Notification (QCN; IEEE802.1Qau)
- Data Center Bridging Capability eXchange (DCBX; IEEE802.1Qaz)
- 8 traffic classes per port; fully DCB compliant per 802.1Qbb

Manageability

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

Power Consumption

- ACPI compliant power management
- PCI Express Active State Power Management (ASPM)
- Ultra low-power mode
- Pass-through Energy Efficient Ethernet (IEEE802.3az-2010)

Power Consumption

- Maximum power consumption 14.1W

Operating Conditions

- 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: 76mm x 115mm (W x D)

1-4 Available SKUs

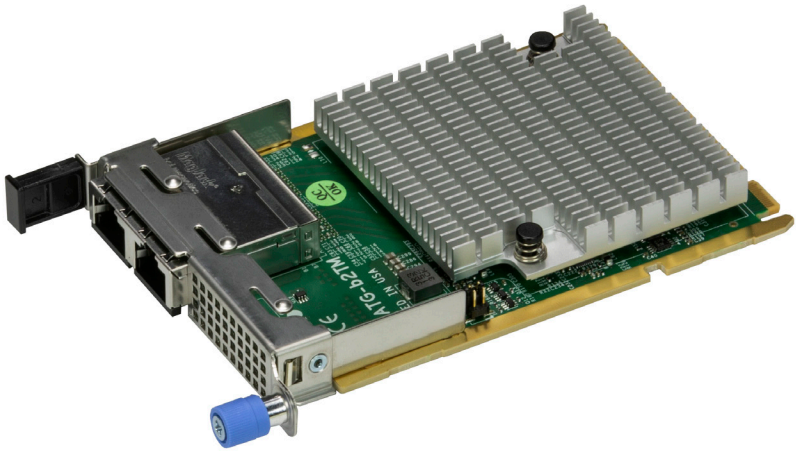
SKUs	Bracket Included	Description
AOC-ATG-b2TM	BKT-0185L	2-port 10 Gigabit Ethernet adapter with a 0.5U height bracket
AOC-ATG-b2TG	BKT-0208L	2-port 10 Gigabit Ethernet Adapter with a 0.5U height narrow bracket for Grand Twin Front IO systems.

Note: This product is only sold as part of an integrated solution with Supermicro server systems.

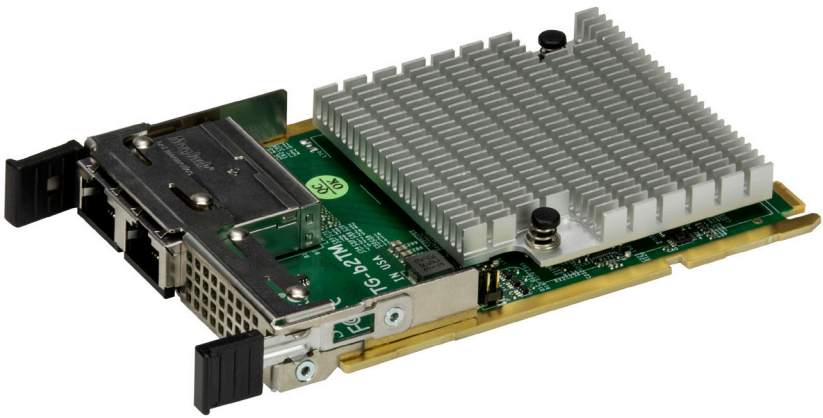
Chapter 2

Hardware Components

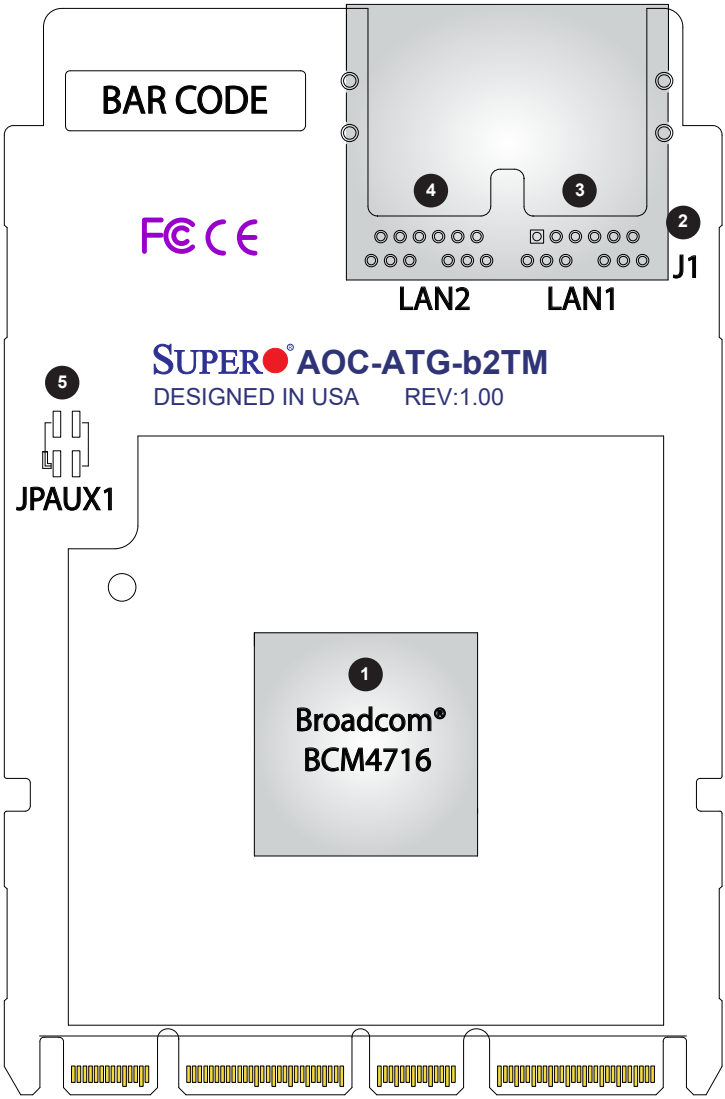
2-1 Add-On Card Image and Layout



AOC-ATG-b2TM Image



AOC-ATG-b2TG Image



AOC-ATG-b2TM and AOC-ATG-b2TG Layout

2-2 Major Components

The following components are on AOC-ATG-b2TM and AOC-ATG-b2TG.

AOC-ATG-b2TM and AOC-ATG-b2TG Major Components		
No	**Component Name**	**Definition**
1	Broadcom® BCM4716	Ethernet controller
2	J1	Connector cage
3	LAN1	LAN Port 1
4	LAN2	LAN Port 2
5	JPAUX1	1-2: Enable AUX Power
		3-4: Disable AUX Power (Default)

2-3 LED Indicators and Connectors

LAN Ports

The AOC-ATG-b2TM and AOC-ATG-b2TG has two network LAN ports. These LAN ports support connection speeds up to 10Gbps. Plug the Direct Attached Copper (DAC) cable into the port for network connections.

Note: To make sure that LAN port functions properly, be sure to use the following cable specified by the manufacturer:

- Direct-attached twin-axial copper cable, or
- Short Range or Long Range fiber optic cable used in conjunction with optional optical transceiver.

LAN LED

Each LAN port connector has two LEDs at the bottom of the PCB. See the table below for more information.

Port Link LED State	
LED Color	Definition
Green	10 Gbps
Amber	<10Gbps

2-4 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.

AOC-JPAUX1 set to Disabled	**When system/MB goes into standby mode**		
	IPMI Support	FailOver Support	WoL Support
	No	No	No
	When system/MB is NOT in standby mode		
	IPMI Support	FailOver Support	WoL Support
	Yes	Yes	N/A
AOC-JPAUX1 set to Enabled	**When system/MB goes into standby mode**		
	IPMI Support	FailOver Support	WoL Support
	Yes	Yes	Yes
	When system/MB is NOT in standby mode		
	IPMI Support	FailOver Support	WoL Support
	Yes	Yes	N/A

JPAUX1 for Standby Power	Function	Definition
Disable = No standby power to AOC NIC	Disable jumper to disconnect the standby power	Default
Enable = Standby power to AOC NIC	Enable jumper to connect standby power to AOC NIC	WoL is supported on two ports but limited to platforms with sufficient airflow when it is in standby mode (S5 state). Please consult Supermicro before enabling it.

2-5 Major Components of AIOM Module

The major components of the Supermicro® Advanced I/O Modules (AIOM) are the card and bracket. Before a computer system can operate, all slots are required to be populated. If an AIOM module is used, be sure that the bracket is firmly installed into the chassis. This will ensure that the card that is installed to the bracket is seated securely in the motherboard connector. For instructions on how to install and uninstall an AIOM module please refer to chapter 3.

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 that 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.

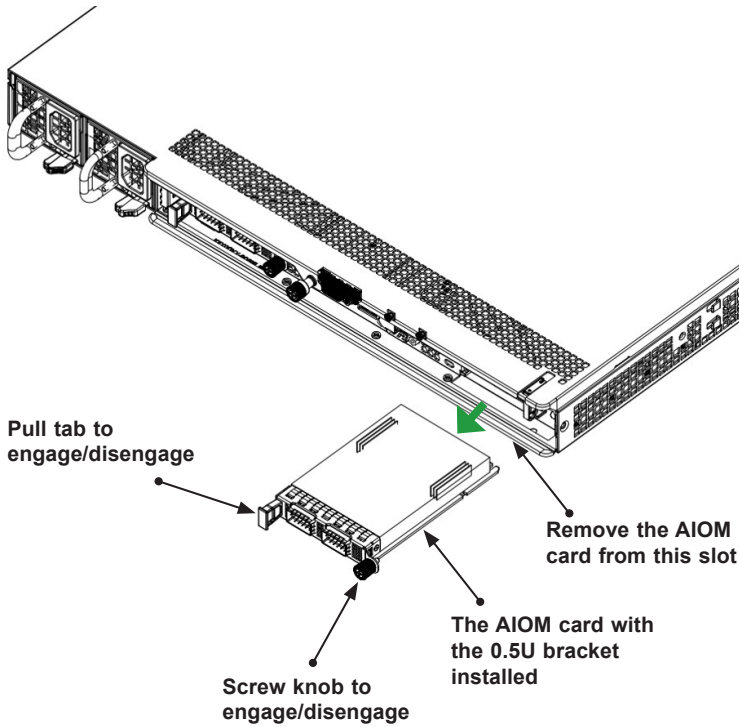
1. Power down the system.
2. Unplug the power cord.
3. Use industry-standard anti-static equipment such as gloves or a wrist strap and follow the precautions on page 3-1 to avoid damage caused by ESD.
4. Familiarize yourself with the server, motherboard, and/or chassis documentation.
5. Confirm that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

3-3 Installing the Add-on Card (with 0.5U bracket)

Follow the steps below 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 top cover for ease of installation)

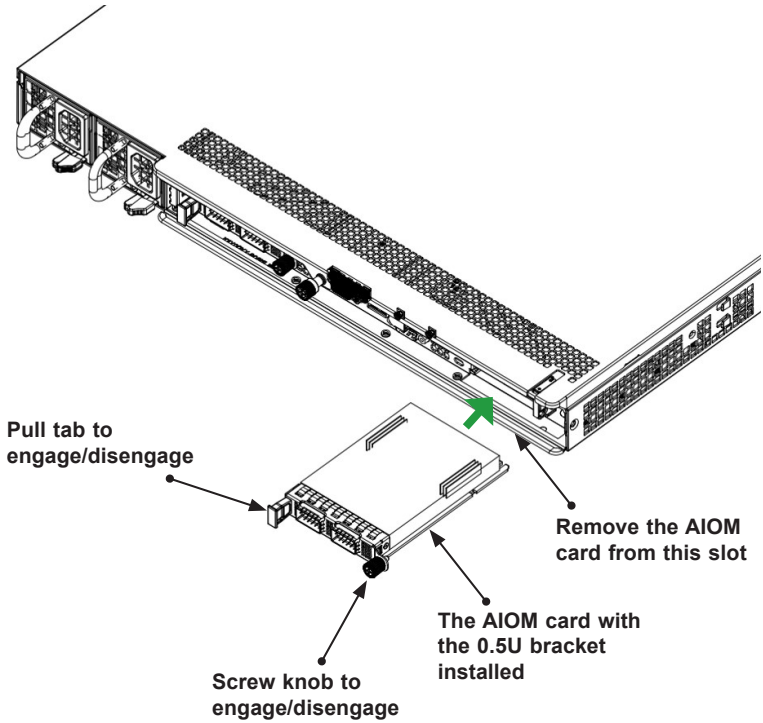
A. Uninstalling an AIOM module

1. Unscrew the blue knob from the system.
2. Pull on the tab and knob evenly on both sides of the card to disengage the AIOM module from the motherboard connector.
3. Gently slide the AIOM module out.



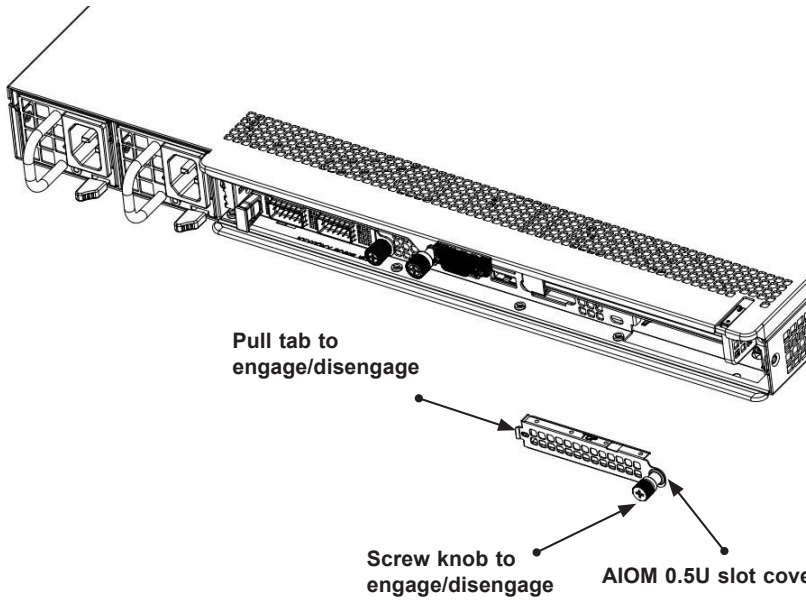
B. Installing an AIOM module

1. Position the AIOM module in front of the empty slot.
2. Gently push onto the metal bracket. The AIOM module should slide into the chassis until the card is securely seated in the connector.
3. Press the blue knob.
4. Turn the knob clockwise to secure module onto the chassis.



C. Installing an AIOM module (An AIOM slot with an AIOM slot cover)

1. Remove the AIOM slot cover by unscrewing the knob and screw that attaches the bracket to the chassis.
2. Pull the bracket away and set it aside.
3. Position the AIOM module in front of the empty slot.
4. Gently push onto the metal bracket. The AIOM module should slide into the chassis until the card is securely seated in the connector.
5. Turn the knob clockwise to secure module onto the chassis.



Note 1: This AIOM module does not support hot plug. Please turn off the AC power and remove the power cord from the wall socket before installing or removing an AIOM module.

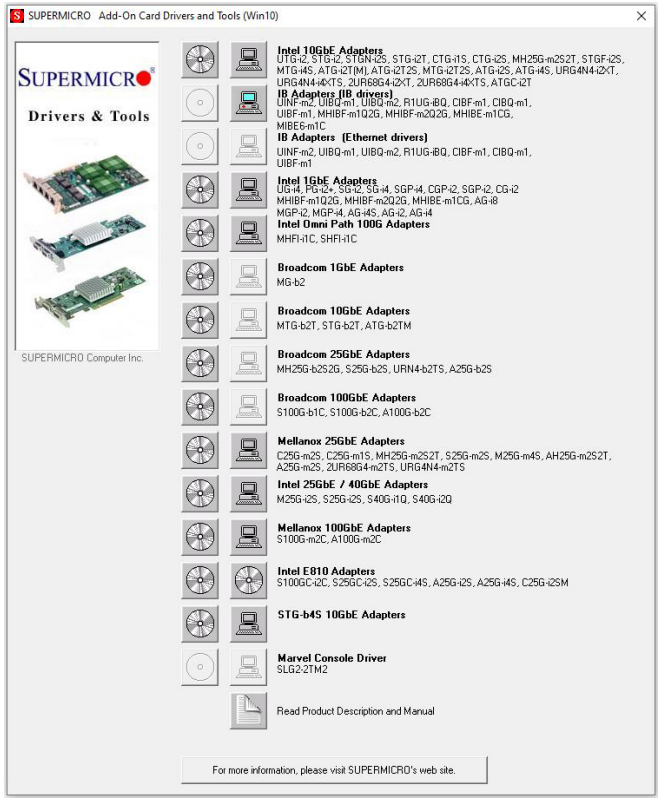
Note 2: Graphics shown above are for illustration purposes only. Actual products may vary due to product enhacement.

3-4 Installing Drivers on Windows

Follow the steps below to install the drivers for the Windows operating systems. Download the drivers from Intel Download Center or the Supermicro site at https://www.supermicro.com/wftp/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 (for Broadcom® BCM57416)

Use the procedures below to install both drivers and firmware for the AOC-ATG-b2TM and AOC-ATG-b2TG add-on card for both Linux and Windows.

Linux Drivers

Use the following procedures to install drivers on the Linux operating system. Download the drivers from ftp://ftp.supermicro/Networking_Drivers/.

Installing 10G Drivers for the Linux Operating System

1. Prerequisites: Install the following:

   ```
   yum -y install libibverbs* infiniband-diags perftest
   qperf librdmacm-utils

   yum -y install groupinstall "InfiniBand Support"
   ```

2. From the CDR-NIC LAN driver CD or FTP site, go to the following directory: Broadcom > 10G > Linux_Driver.

3. Download the Linux driver package file netxtreme-bnxt_en-<ver>.tar.gz.

4. Install the driver by entering the following commands:

   ```
   tar xzvf nextreme-bnxt_en-<ver>.tar.gz

   cd nextreme-bnxt_en-<ver>

   make build

   make install
   ```

5. You will need to install RoCE library if you want to use RoCE.

6. From the CDR-NIC LAN driver CD or FTP site, go to the following directory: Broadcom > 10G > Linux_RoCE_Lib.

7. Download libbnxtre-<ver>.tar.gz.

8. Install the library by entering the following commands:

```
tar xvzf libbnxtre-<ver>.tar.gz

cd libbnxtre-<ver>.tar.gz

./configure

make

make install

cp bnxtre.driver /etc/libibverbs.d/

echo "/usr/local/lib" >> /etc/ld.so.conf

ldconfig -v
```

Windows Drivers

Use the following procedures to install drivers on the Windows operating system.

Installing 10G Drivers for the Windows Operating System

1. From the CDR-NIC LAN driver CD or FTP site, go to the following directory: Broadcom > 10G > Windows.
2. Choose the desired Windows driver package folder.
3. Drivers are in .inf format. You can install the driver from Device Manager.

(Disclaimer Continued)

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