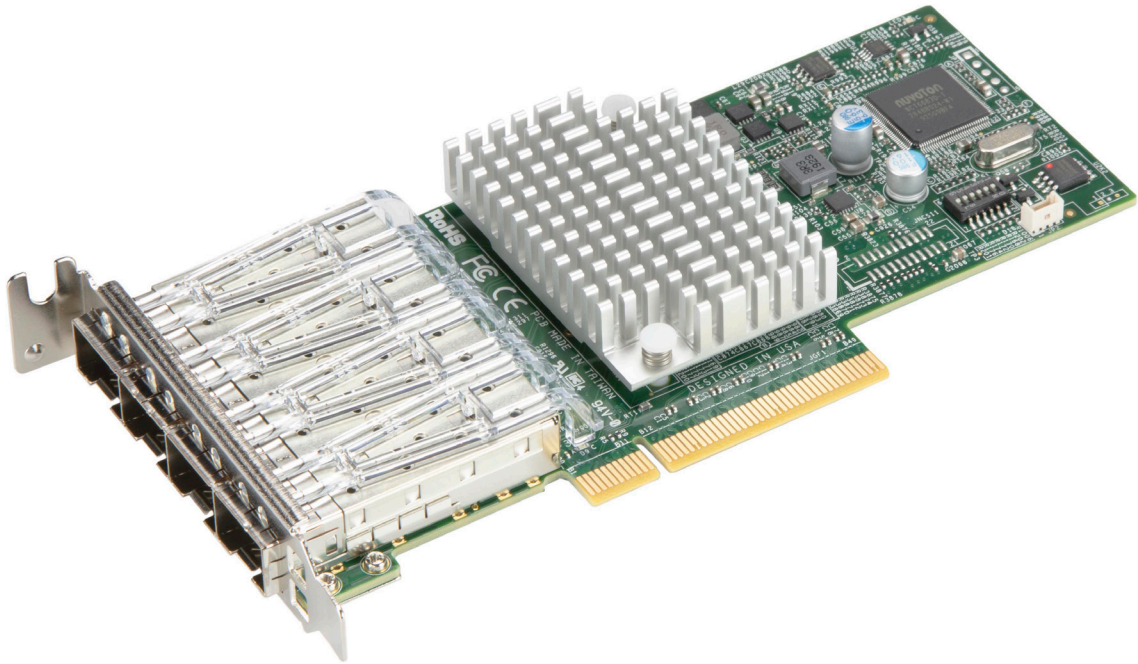# AOC-STG-i4S

USER'S MANUAL

Revision 1.1a

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Manual Revision 1.1a

Release Date: February 04, 2025

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-STG-i4S add-on card.

About This Add-On Card

The AOC-STG-i4S is an advanced, market-leading 10 GbE SFP+ controller. The four LAN ports on the card provide a connection speed of 10 Gbps. The card features the Intel® XL710-BM1 controller and is supported on the Windows and Linux operating systems. It expands virtualization beyond the server level to the network level and combines with hardware optimizations and offloads. It provides unmatched features for virtualization, flexibility for LAN and SAN networks, and reliable performance. This is the best choice for rapid provisioning of networks in an agile data center.

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

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 (http://www.supermicro.com/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.
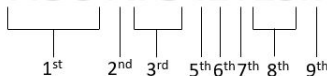
Important Links

For your system to work properly, follow the links below 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: http://www.supermicro.com/about/policies/safety_information.cfm

- 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/

- If you have any questions, contact our support team at: 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

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

Naming Convention

AOC-ATG-i2T2SM

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), L: Lewisburg (PCH)
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
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 SIOM – Non-M: swappable bracket for Storage systems, M: Internal bracket for Twin systems. For AIOM – Non-M: 1U height bracket for Edge systems, M: 0.5U height bracket for all other systems.

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Table of Contents

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:

- Quad SFP+ ports

- Standard low-profile form factor

- PCI Express (PCIe) 3.0 (8 GT/s)

- Network Virtualization Offloads including VXLAN and NVGRE

- Small packet performance

- Data Plane Developer Kit for efficient packet processing

- Low Power Consumption

- Intel® Flow Director

- Intelligent Offloads

- Unified networking providing a single wire support for LAN and storage

- Asset Management Features

- Supports both Direct Attach Copper (DAC) and fiber cables

- RoHS compliant 6/6

1.3 Specifications

General

- Intel XL710-BM1 controller

- Low profile standard form factor

- PCIe 3.0 x8 (8 GT/s) interface

- Quad SFP+ connectors with speed up to 10 Gbps per port

- Load balancing on multiple CPUs

- Intel® PROSet Utility for Windows Device Manager

- Time Sync (IEEE 1588)

- Energy Efficient Ethernet (EEE)

- Dynamic Device Personalization (DDP)

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

- Jumbo Frame (9.5 KB)

Virtualization Features

- Next-Generation VMDq with up to 256 VMDq VMs supported

- PCI-SIG SR-IOV with up to 128 virtual ports

- Virtual Machine Load Balancing (VMLB)

- Advanced Packet Filtering

- VLAN support for up to 4096 VLAN tags

- VXLAN and NVGRE support

Storage Interface Features

- Preboot eXecution Environment (PXE) support

- iSCSI remote boot

- Simple Network Management Protocol (SNMP) and Remote Network Monitoring (RMON) static counters

Management Features

- Asset Management support on Supermicro® X10 generation platforms

- Controller asset tags such as part number, revision, serial number, and MAC addresses

- Controller thermal sensor

Advanced Software Features

- Teaming support

- IEEE 802.3ad (link aggregation control protocol)

- IEEE 802.1Q VLANs

- IEEE 802.3 2005 flow control support

- IEEE 802.1p

- TCP segmentation/large send offload

- Interrupt moderation

OS Support

The AOC-STG-i4S add-on card supports the following operating systems:

- Windows® Server 2012 R2, 2012, 2008 R2 X86-64

- Linux RedHat EL 6.5 and 7.0 IA-32, X86-64, and IA-64

- Linux SuSE SLES 11 SP3 and 12 IA-32, X86-64, and IA-64

- FreeBSD 9 and 10 IA-32, X86-64, and IA-64

- UEFI 2.1 and 2.3 X86-64 and I-64

- VMware ESXi 5.1 and ESXi 5.5 X86-64

Cable Support

- SFP+ direct-attach twinaxial copper cables up to 7 m

- Fiber-optic cables (with optional SFP+ transceivers)

Power Consumption

- Typical power consumption: 4 W

- Maximum power consumption: 8 W

Physical Dimensions

- Card PCB dimensions: 2.73" (6.90 mm) x 5.9" (149.9 cm) x 0.061" (1.5494 mm) (H x W x D)

- Height of end brackets: Standard 4.725" (120 mm), low-profile 3.13" (79.4 mm)

Optional Accessories

- AOC-E10GSFPSR: SFP+ transceiver module for short range fiber cables (up to 300 m)

- AOC-E10GSFPLR: SFP+ transceiver module for long range fiber cables (up to 3000 m)

- AOC-TSR-FS: SFP+ transceiver module for short range fiber cables (up to 300 m)

- CBL-0347L: 39.37" (100 cm) 10 GbE SFP+ to SFP+, Twinaxial copper cable

- CBL-0348L: 118.11" (300 cm) 10 GbE SFP+ to SFP+, Twinaxial copper cable

- CBL-0349L: 196.85" (500 cm) 10 GbE SFP+ to SFP+, Twinaxial copper cable

Environmental Conditions

- Storage temperature: -40°C to 70°C (-40°F to 158°F)

- Storage humidity: 90% non-condensing relative humidity at 35°C

Compliance Platforms
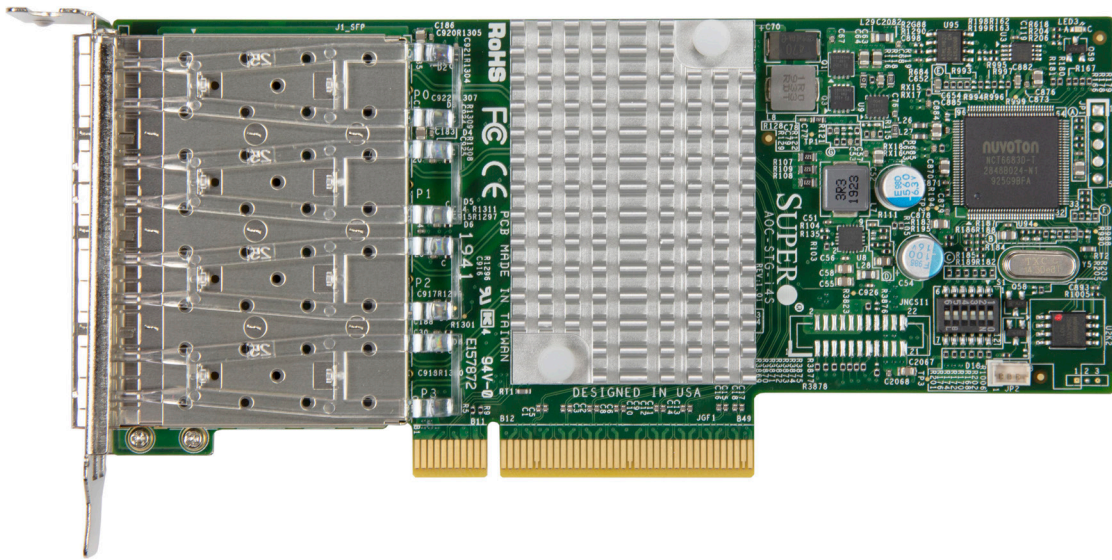
- RoHS Compliant 6/6, Pb Free

Supported Platforms

- Supermicro® motherboards with minimum one PCIe x8 slot

- Supermicro® server systems with minimum one low-profile or full-height PCIe x8 expansion slot
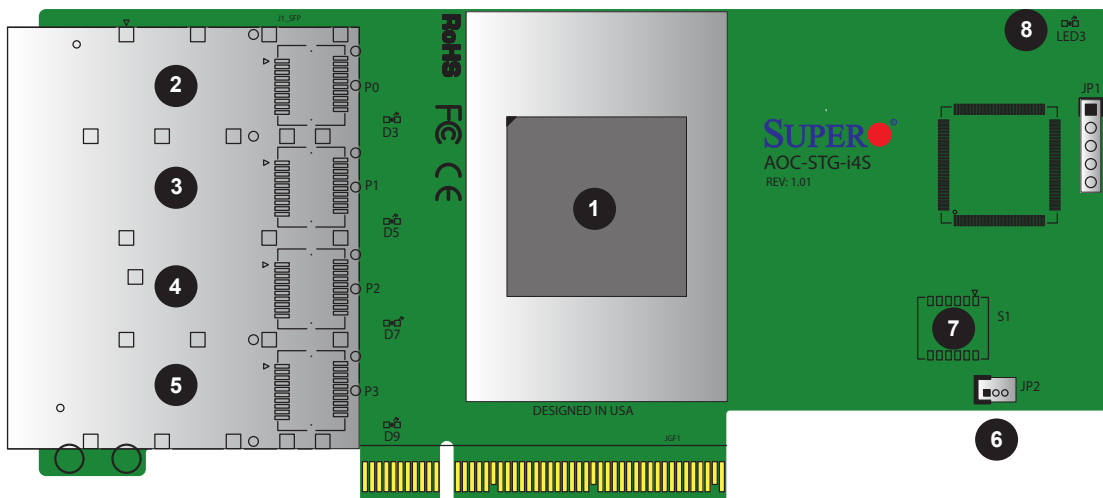
Chapter 2

Hardware Components

2.1 Add-On Card Image and Layout

AOC-STG-i4S Image

AOC-STG-i4S Layout

2.2 Major Components

The following major components are installed on the AOC-STG-i4S:

| No	Component Name	Definition
AOC-STG-i4S Major Components		
1	Intel® XL710-BM1	Ethernet LAN controllers
2	J1_SFP P0	SFP+ Port 0
3	J1_SFP P1	SFP+ Port 1
4	J1_SFP P2	SFP+ Port 2
5	J1_SFP P3	SFP+ Port 3
6	JP2	Thermal Alert
7	S1	DIP Switch
8	LED3	Thermal Alert LED

2.3 LAN Ports and LAN LED Indicators

LAN Ports

There are four SFP+ LAN ports on the add-on card. These LAN ports support connection speeds of 10 Gbps and 1 Gbps. Use a direct-attach twinaxial copper cable.

Note: Refer to "Optional Accessories" on page 12 for recommended cables.
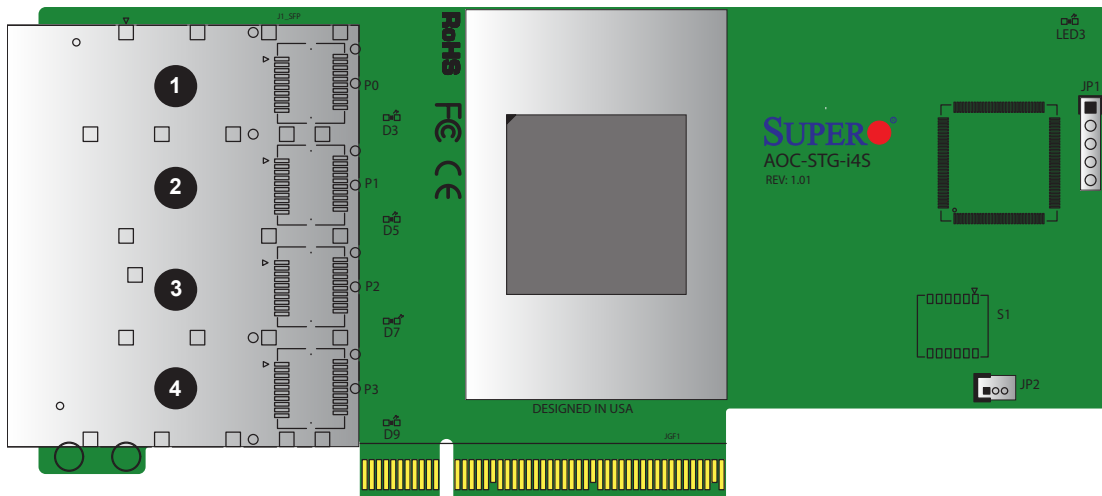
LAN Port LED Indicators

Each SFP+ LAN port has two LEDs to indicate speed and data activity. The LEDs will be lit in different colors to indicate different statuses.

Link LED   Activity LED
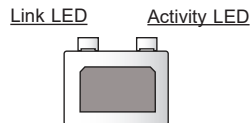
SFP+ LAN Port LEDs		
LED	**Color**	**Definition**
Activity	Blinking Green	Activity
Link	Green	10 Gb Link Speed
	Yellow	1 Gb Link Speed

2.4 Connectors and Switches

Thermal Alert Connector

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.

| Thermal Alert Pin Definition	
Pin	**Definition**
1	GND
2	Thermal_Alert_N
3	GND

Thermal Alert LED

A thermal alert LED is located at LED3. The yellow LED indicates there is a thermal alert. Refer to the table on the right for the LED status. Refer to page 14 for the location of the LED.

DIP Switch

The DIP Switch at S1 provides SMBUS address selection. You can configure the card with a static SMBUS address. Refer to the tables below for address selections. Refer to page 13 for the location of the switch.
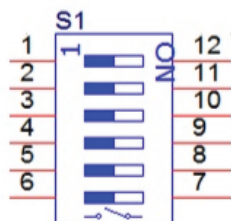
S1 DIP Switch for User Selection		
Switch Position	**OFF (Default)**	**ON**
1	SMBUS ARP Mode	Static SMBUS Address Mode
2–5	Static SMBUS Address Selection	
6	Thermal Reading Enable	Thermal Reading Disable

Static SMBUS Address Selection Table by DIP Switch S1				
SMBUS Address	**S1 Position #5**	**S1 Position #4**	**S1 Position #3**	**S1 Position #1**
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

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 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 below.

1. Power down the system.

2. Remove the power cord from the wall socket.

3. Use industry-standard antistatic equipment (such as gloves or wrist strap) and follow the instructions listed on page 18 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.

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 and its screw.

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 server cover.

7. Plug in the power cord and power up the system.

3.4 Installing Drivers in Windows

Follow the steps below to install the drivers for Windows. Download the latest *CDR-NIC* drivers from ftp://ftp.supermicro.com/Networking_Drivers/.

1. Run the *CDR-NIC* drivers installation.

2. When the SUPERMICRO window appears, click on the computer icon next to the product model.
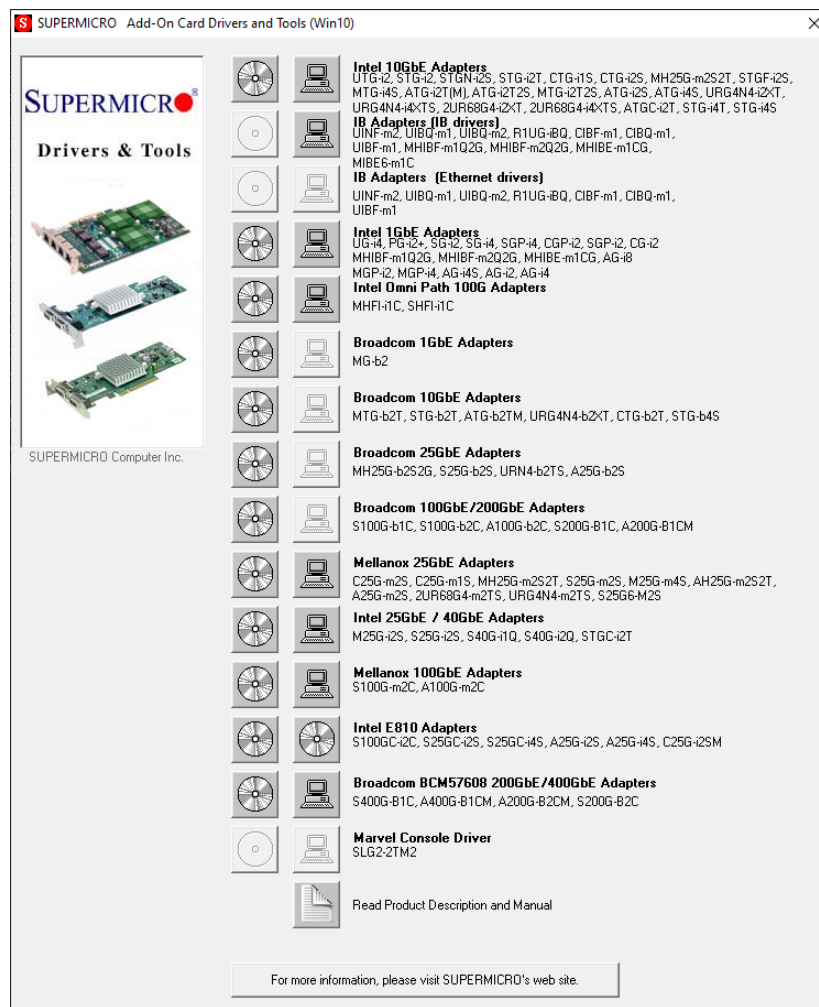
> **Note**: If the *FOUND NEW HARDWARE WIZARD* screen displays on your system, click CANCEL.

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

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/i40e
   ```

   or

   ```
   /usr/local/src/i40e
   ```

2. Untar/unzip the archive:

   ```
   tar zxf i40e-x.x.x.tar.gz
   ```

3. Change to the driver src directory:

   ```
   cd i40e-x.x.x/src/
   ```

4. Compile the driver module:

   ```
   make

   make install
   ```

The binary will be installed as:

```
/lib/modules/[KERNEL_VERSION]/kernel/drivers/net/i40e/i40e.[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.

```
make CFLAGS_EXTRA="-i40e_NO_LRO" install
```

> ✎ **Note:** I40E_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=-"I40E_NO_LRO" to the make file when it's being compiled.

5. Load the module:

For kernel 2.6.x, use the modprobe command:

```
modprobe i40e
```

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/i40e/
i40e.ko
```

In addition, when using 2.6-based kernels, make sure that older i40e drivers are removed from the kernel before loading the new module. To do this, use:

```
rmmod i40e; modprobe i40e
```

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>
```

(Disclaimer Continued)

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