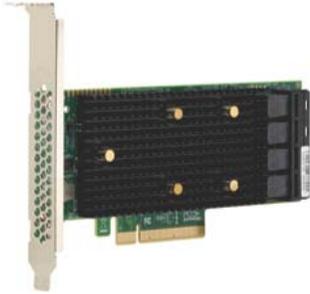**BROADCOM**®

Quick Installation Guide
HBA 9400-16i and HBA 9400-8i Tri-Mode Storage Adapters

Thank you for purchasing the Host Bus Adapter (HBA). Please take a few minutes to read this quick installation guide before you install the HBA.

ATTENTION: Perform all installation work at an electrostatic discharge (ESD)-safe workstation that meets the requirements of EIA-625. *Requirements for Handling Electrostatic Discharge Sensitive Devices*. You must perform all actions in accordance to the latest revision of the IPC-A-610 ESD-recommended practices.

Hardware Installation Instructions

To install the Tri-Mode HBA, follow these steps:

1. **Unpack the HBA, and inspect it for damage.** Unpack the HBA in a static-free environment. Remove the HBA from the antistatic bag, and carefully inspect the device for damage. If you notice any damage, contact Broadcom or your reseller sales and support representative.

ATTENTION: Risk of data loss – To avoid the risk of data loss, back up your data before you change your system configuration.

2. **Prepare the computer.** Turn off the computer, and disconnect the power supply.

CAUTION: **Risk of electrical shock – Disconnect the computer from the power supply and from any networks to which you will install the HBA, or you risk damaging the system or experiencing electrical shock.**

3. **Remove the cover from the chassis.**
4. **Check the mounting bracket on the HBA (system dependent).** If required for your system, replace the full-profile mounting bracket that ships on the HBA with the low-profile bracket supplied. Complete the following steps to attach the low-profile bracket.

   a. Using a No. 1 Phillips screwdriver that is ESD safe, remove the two Phillips screws that connect the full-profile bracket to the board. Unscrew the two screws located at the top and bottom edges of the board. Avoid touching any board components with the screwdriver or bracket.

   b. Remove the full-profile bracket. Do not damage the HBA.

   c. Place the HBA on top of the low-profile bracket. Position the bracket so that the screw holes in the tabs align with the openings in the board.

   d. Using a No. 1 Phillips torque screwdriver that is ESD safe, set to a maximum torque of 4.8 ± 0.5 inch-pounds. Replace the two Phillips screws removed in step a.

ATTENTION: Possible hardware damage – Exceeding this torque specification can damage the board, connectors, or screws, and can void the warranty on the board.

5. **Insert the HBA into an available PCIe slot.** Locate an empty x8 PCIe slot adequate for your board. Remove the blank bracket panel on the rear of the computer that aligns with the empty PCIe slot. Save this bracket screw, if applicable. Align the HBA to a PCIe slot. Press down gently, but firmly, to seat the HBA correctly in the slot. The following figure shows how to insert the HBA into a PCIe slot.

NOTE: The shape, size, and locations of the components on your HBA and its bracket might vary from this illustration. The HBA requires an x8 PCIe slot.

Figure 1 Install the HBA 9400-16i Tri-Mode Storage Adapter in a PCIe Slot
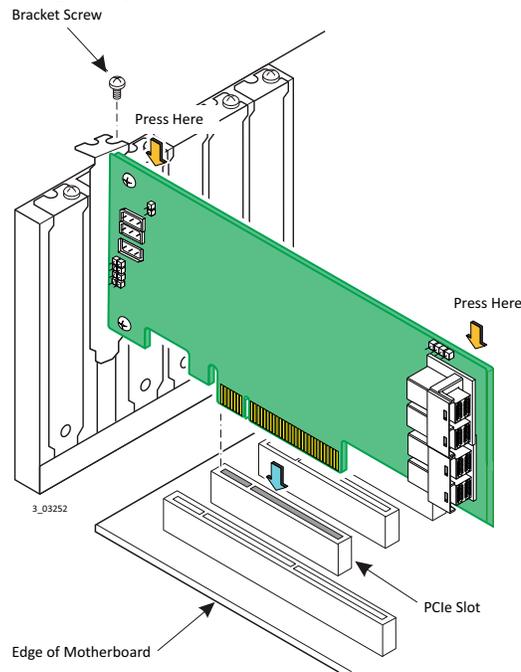

NOTE: This example shows the HBA 9400-16i adapter being installed. The HBA 9400-8i adapter is connected in the same way. The difference between the two controllers is that the HBA 9400-16i adapter supports 16 ports, and the HBA 9400-8i adapter supports eight internal ports.

6.   Connect the cables between the adapter and the mid-plane or storage devices. The HBA 9400-16i adapter has four SFF-8643 internal x4 Mini SAS HD connectors and the HBA 9400-8i adapter has two SFF-8643 internal x4 Mini SAS HD connectors.

• For SAS/SATA connections, connect standard 12Gb/s SAS cables with an internal Mini SAS HD connector on one end to connect to the controller and the appropriate connector on the other end to attach to the backplane or to the SAS/SATA devices.

• For PCIe/NVMe connections, use the appropriate U.2 enabler cable to enable connection to the backplane connectors, as shown in the following figure. The U.2 enabler cable routes the REFCLK, sidebands, and PCIe signals to the appropriate pins on the backplane connector. Different U.2 enabler cables are available depending on the backplane connector type. Using standard 12Gb/s SAS cables for NVMe connections might result in damage to the PCIe adapter or the drive. For more information, refer to the *Storage Adapter Cable Guide* and the *Broadcom MegaRAID® and HBA Tri-Mode Storage Adapters User Guide* at http://www.broadcom.com/support/download-search.

CAUTION: Possible hardware damage – For NVMe connections to a SFF-8639 (U.2) bay or connections to a PCIe switch, use only approved cables with REFCLK forwarded on the proper pins. Improperly connecting a standard 12Gb/s SAS cable to a SFF-8639 bay can damage the PCIe storage adapter and the drive.

Figure 2 Use U.2 Enabler Cables to Connect to NVMe Drives
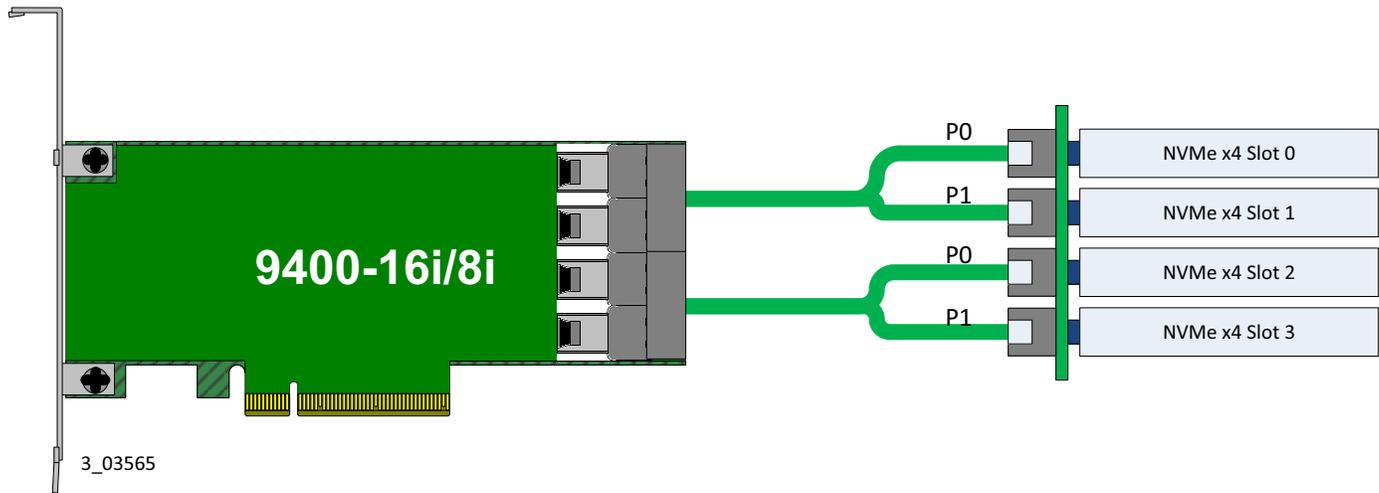
Each leg of the U.2 enabler cable must connect to adjacent drives; otherwise, the LEDs might not work properly. It does not matter which leg of the cable is plugged into which connector pair as long as adjacent pairs are used. For more information on NVMe LED functionality, refer to the *Broadcom MegaRAID and HBA Tri-Mode Storage Adapters User Guide.*

7.   **Make sure the system provides the required airflow for the controller.** The following table shows the required airflow and inlet temperature for the HBA 9400-16i and HBA 9400-8i Tri-Mode storage adapters. The adapter requires appropriate airflow and inlet temperature to avoid operating the Tri-Mode I/O controller (SAS3416 or SAS3408) above the maximum junction temperature.

Table 1 Airflow and Inlet Temperature Requirements

PCIe Adapter	Airflow	Inlet Temperature
9400-16i	200 LFM	55°C
9400-8i	200 LFM	55°C

8.   **Replace the cover and reconnect any cords and cables, and power up the system.** Replace the chassis's cover, reconnect any power cords, and reconnect any network cables. Turn on the power.

9.   **Install drivers and check for updates.** Broadcom routinely post updates for firmware, drivers, and utilities. Check for the latest updates on the support and download center, http://www.broadcom.com/support/download-search.

The default firmware loaded on the adapter enables connections to SAS, SATA, and PCIe (NVMe) storage devices.

For more information on connecting SAS, SATA, and PCIe (NVMe) storage devices to the adapter, refer to the *Broadcom MegaRAID and HBA Tri-Mode Storage Adapters User Guide* at http://www.broadcom.com/support/download-search.

The hardware installation of your Tri-Mode storage adapter is complete.

TECHNICAL SUPPORT

For assistance installing, configuring, or running the HBA, contact Broadcom Technical Support:

Website: www.broadcom.com

WARRANTY NOTICE

1.   The warranty does not cover the return of parts damaged by changing the bracket.

2.   The warranty does not cover ESD damage to the HBA. HBAs returned without a bracket mounted on the board will be returned without return merchandise authorization (RMA) processing.

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