

## Using Tri-mode NVMe HBA/RAID card with MB699VP-B / MB601VK-B

After thorough testing, it has been revealed that there is a compatibility issue when using the ToughArmor MB699VP-B and MB601VK-B with certain Intel and Broadcom **Tri-Mode** HBA and RAID cards. The issue is caused by RAID card manufacturers using a different pinout for Tri-Mode cards than is typically used for U.2 connections. When using the Tri-Mode cards with U.2 NVMe drives, a **U.2 enabler cable must be used** for Tri-Mode card to detect the U.2 drive, which reverts the pinout back to standard U.2 specifications.

Broadcom has listed some cautionary steps that should be taken to ensure compatibility and to avoid damage to drives, RAID cards, and enclosures:

- For PCIe / NVMe connections, use the appropriate **U.2 enabler cable** to enable connection to the backplane connectors. The U.2 enabler cable routes the REFCLK, sidebands, and PCIe signals to the appropriate pins on the backplane connector.
- Using standard 12Gb/s SAS cables for NVMe connections might result in damaging to the PCIe adapter or the drive.

This issue is currently known to affect the following Tri-Mode HBA and RAID cards. You can find the compatible U.2 enabler cable model # from the tables below:

Compatible U.2 enabler cable for ToughArmor MB699VP-B + Tri-Mode cards		
Tri-Mode Controller Card Model#	U.2 Enabler Cable Model#	
<a href="#">Boardcom HBA 9400-16i</a>	<a href="#">-Broadcom 05-50061-00, U.2 Enabler Cable, Mini SAS HD (x8) to 2 x4 Mini SAS HD(W), 1.M</a>	
<a href="#">Boardcom HBA 9405W-16i</a>		
<a href="#">Boardcom HBA 9400-8i</a>		
<a href="#">Boardcom HBA 9400-8i8e</a>		
<a href="#">Boardcom MegaRAID 9460-16i</a>		
<a href="#">Boardcom MegaRAID 9480-8i8e</a>		
<a href="#">Boardcom MegaRAID 9460-8i</a>		<a href="#">-Serial Cables PCI-43X8-43X2i-1M-N2, U.2 Enabler Cable, Mini SAS HD (x8) to 2 x4 Mini SAS HD(W), 1M</a>
<a href="#">Boardcom MegaRAID 9440-8i</a>		
<a href="#">Intel RAID RSP3TD160F</a>		<a href="#">-Serial Cables PCI-43X8-43X2i-0.5M-N2, U.2 Enabler Cable, Mini SAS HD (x8) to 2 x4 Mini SAS HD(W), 0.5M</a>
<a href="#">Intel RAID RSP3MD088F</a>		
<a href="#">Intel RAID RSP3WD080E</a>		
<a href="#">Intel RAID RSP3DD080F</a>		
<a href="#">Intel RAID RMSP3AD160F</a>		
<a href="#">Intel RAID RMSP3CD080F</a>		
<a href="#">Intel RAID RMSP3HD080E</a>		
<a href="#">Intel RAID RMSP3HD080E</a>		

Compatible U.2 enabler cable for ToughArmor MB601VK-B + Tri-Mode card	
Tri-Mode Controller Card Model#	U.2 Enabler Cable Model#
<a href="#">Boardcom HBA 9400-16i</a>	<a href="#">-Broadcom 05-50065-00, U.2 Enabler Cable, Mini SAS HD (x8) to 2 x4 SFF-8639, 0.5M</a>  <a href="#">-Broadcom 05-50064-00, U.2 Enabler Cable, Mini SAS HD (x8) to 2 x4 SFF-8639, 1M</a>  <a href="#">-Serial Cables BWD-43X8-39X2-1M, U.2 Enabler Cable, Mini SAS HD (x8) to 2 PCIe Multilink SFF-8639, 1M</a>  <a href="#">-Serial Cables BWD-43X8-39X2-0.5M, U.2 Enabler Cable, Mini SAS HD (x8) to 2 PCIe Multilink SFF-8639, 0.5M</a>
<a href="#">Boardcom HBA 9405W-16i</a>	
<a href="#">Boardcom HBA 9400-8i</a>	
<a href="#">Boardcom HBA 9400-8i8e</a>	
<a href="#">Boardcom MegaRAID 9460-16i</a>	
<a href="#">Boardcom MegaRAID 9480-8i8e</a>	
<a href="#">Boardcom MegaRAID 9460-8i</a>	
<a href="#">Boardcom MegaRAID 9440-8i</a>	
<a href="#">Intel RAID RSP3TD160F</a>	
<a href="#">Intel RAID RSP3MD088F</a>	
<a href="#">Intel RAID RSP3WD080E</a>	
<a href="#">Intel RAID RSP3DD080F</a>	
<a href="#">Intel RAID RMSP3AD160F</a>	
<a href="#">Intel RAID RMSP3CD080F</a>	
<a href="#">Intel RAID RMSP3HD080E</a>	

For more information regarding the Tri-mode and where to purchase the U.2 enabler cable, please contact your HBA or RAID card manufacturer.