

AMI MG9098 Backplane Controller

For NVMe/SATA/SAS Backplanes



The MG9098 Backplane Controller is a low-cost, small footprint single-chip solution for enclosure management of single and dual ported NVMe SSD Backplanes as well as traditional SATA/SAS backplanes. It can also manage backplanes with combination of SAS/SATA & NVMe SSDs. A single controller supports up to 8 drives, with support for up to 32 drives with four MG9098 controllers. Host Hot-Plug VPP or SHP SMBus is used for LED management of NVMe backplanes, and SGPIO for SATA/SAS backplanes. Optionally, LED management can also be achieved with BMC SMBus.

The AMI MG9098 enables the world's leading enterprise system builders and data center solution providers to design low-cost, robust backplane solutions for NVMe, SAS and SATA-based storage subsystems.

A true single-chip solution, the AMI MG9098 helps optimize backplane layouts with the latest enclosure management technologies. This highly integrated and space-optimized chip is available in compact QFN-64 package (9mm x 9mm) and supports all the features needed in a modern state-of-the-art SAS/SATA/NVMe backplane. MG9098 also ships ready to use, with no firmware or programming required at power-on. Firmware is upgradable through SMBus from host BMC.

BENEFITS

Developed to reduce latency and provide faster CPU to data storage device performance, NVMe (Non-Volatile Memory Express) is a scalable, high performance specification for accessing solid state drives (SSDs) attached directly to the PCI Express bus. The MG9098 leverages the power signals on NVMe/SATA/SAS drive connector (SFF-8639) to detect drive presence, type, and activity.

LED management of NVMe SSDs is done through SMBus Host Hot-Plug VPP or SHP Bus. For SATA/SAS drives, this is done through the SGPIO (SFF-8485) specification. Optionally, LED management can also be done with proprietary BMC SMBus commands. The MG9098 also provides Power Disable/Device Sleep outputs for SATA/SAS & NVMe drives. MG9098 also issues PCIe resets to individual dual-ported PCIe/NVMe SSDs, when such a command is received from the host.

The MG9098 backplane controller supports 2-LED and 3-LED IBPI blinking patterns, along with many pre-defined custom LED blinking patterns. Custom blinking patterns can also be downloaded through the BMC SMBUS. The 3-LED IBPI blinking pattern is defined in the table below:

MG9098 PROGRAM VERSIONS

Different program versions of MG9098 controller are available to support various features required in a modern state-of-the-art backplane for Single/Dual ported NVMe & SAS/SATA drives. Major differences between MG9098 versions are listed in the table below:

Differences	MG9098 Program Versions		
	A	B	C
SGPIO (SFF-8485) support	Yes	Yes	No
Dual-ported PCIe/NVMe SSD support	No	No	Yes
Platform supported	Intel	Intel/AMD/Avago/Microsemi	Dual ported Intel/AMD/Avago/Microsemi
SHP Interrupt	None	1	2
PCIe Reset Availability	No	No	Yes

HIGHLIGHTS:

- Supports Intel VMD Enclosure Management for PCIe/NVMe SSDs through dual VPP SMBus for CPU0 & CPU1 from Intel
- Supports Linux Enclosure Management for PCIe/NVMe SSDs through dual SHP SMBus for CPU0 & CPU1 from AMD
- Enclosure management of PCIe/NVMe SSDs connected to Avago/Microsemi PCIe switches is also supported in MG9098
- Supports 2 channels of SGPIO (SFF-8485) bus for enclosure management of SATA/SAS drives
- Supports IBPI specification (SFF-8489)
- Supports Optional Enclosure Management of NVMe/SATA/SAS drives through BMC SMBus
- Supports Activity and Status LEDs for each drive
 - Both 2-LED and 3-LED blinking supported for up to 8 drives
 - Drives 2 or 3 LEDs per slot for up to 8 slots through LED Matrix
 - Separate LEDs for Activity, Locate & Fail drives states
 - Combination of Locate and Fail LEDs blink for additional drive states
 - Preloaded and downloadable custom LED blinking patterns supported
 - Global Act and Global Fail LEDs supported
 - Support for up to 32 drives with four MG9098 controllers
- Hot-plug support with Host Hot-Plug SMBus (VPP)
- Power Disable support for SAS drives.
- Supply range 3.3V +/- 5%
- Small QFN-64 Package with 9mm x 9 mm pin outline
- Internal Oscillator, no external crystal needed
- Ships ready to use, no firmware or programming required
- Firmware upgradable through SMBus from host BMC
- Diagnostics and FW upgrade tools available for Windows®, Linux®, EFI and DOS



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For more information: <https://ami.com/products/backplanes-and-enclosure-management>