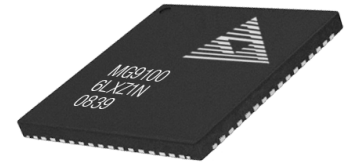


# MG9100 NVMe SSD Universal Backplane Management (UBM) Controller

For NVMe/SATA/SAS Backplanes



*The MG9100 UBM Controller from American Megatrends is a low-cost, small footprint solution for enclosure management of single and dual-ported NVMe SSD Backplanes as well as traditional SAS/SATA backplanes. A single MG9100 controller supports up to eight drives, while a maximum of 32 drives are supported when four MG9100 controllers are cascaded together.*

The AMI MG9100 controller enables the world's leading enterprise system builders and data center solution providers to design low-cost, robust backplane solutions for U.2/U.3 NVMe, SAS and SATA-based storage subsystems.

The AMI MG9100 controller 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. This chip can also manage backplanes with a combination of SAS/SATA and NVMe SSDs.

## BENEFITS

The MG9100 backplane controller ships ready to use, with no firmware or programming required at power-on. Its firmware is upgradable through SMBus™ from the host BMC. Communication with the UBM controller on the host with two UBM SMBus buses on the MG9100 is done through the Universal Backplane Management (UBM) protocol. Legacy protocols such as SGPIO (SFF-8485), BMC, VPP/SHP are also supported by the MG9100 for LED management of NVMe and SAS/SATA drives.

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 MG9100 backplane controller leverages the signals on the NVMe/SAS/SATA drive connector (SFF-8639) to detect drive presence, type, and activity.

LED management of NVMe SSDs is done either through UBM SMBus or through Host Hot-Plug VPP or SHP SMBus. For SAS/SATA drives, this is done through the SGPIO (SFF-8485) specification. Optionally, LED management can also be done with proprietary BMC SMBus commands.

The MG9100 backplane controller also 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 MG9100 backplane controller provides power disable/device sleep outputs for SAS/SATA & NVMe drives. It can also issue PCIe resets to individual dual-ported PCIe/NVMe SSDs, when such a command is received from the host.

## HIGHLIGHTS:

- Supports U.2 and U.3 Drives
- Supports UBM enclosure management through Dual/Quad UBM SMBus from UBM controller on the host
- Supports enclosure management of direct-attached PCIe®/NVMe™ SSDs connected to Intel®/AMD CPU0 & CPU1 through dual VPP/SHP SMBus
- Enclosure management of PCIe/NVMe SSDs connected to Broadcom®/Microsemi® PCIe switches
- Supports two channels of SGPIO (SFF-8485) bus for enclosure management of SAS/SATA 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 eight drives
  - Separate LEDs for activity, locate & fail drive states
  - Supports preloaded and downloadable custom LED blinking patterns
  - Supports global act and global fail LEDs
  - Support for up to 32 drives with four MG9100 controllers
- Power disable support for SAS/SATA/NVMe drives
- Supply range: 3.3V +/- 5%
- Small QFN-64 Package with 9 mm x 9 mm pin outline
- 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®

## MG SERIES BACKPLANE CONTROLLER FROM AMI

The MG Series Backplane Controllers from AMI provide LED and drive management for SAS/SATA/U.2 & U.3 NVMe drives. They provide exceptional flexibility and require minimal board real estate, making them a perfect fit for numerous applications. A wide selection of reference designs and development tools are available to help speed the design process.

MG Series Backplane Controllers work with any HBA supporting SGPIO (SFF-8485) and/or SES-2 protocol over I2C. They can be flashed or upgraded via SMBus from the motherboard BMC, or USB, depending on the model.

## MG SERIES COMPARISON CHART

The matrix below compares the key features of the MG Series Backplane Controllers from AMI. For more detail on individual models, see the individual MG Series Backplane Controller product page on our ami.com website and download the product Data Sheet for the full product specification.

Features	MG9100	MG9098	MG9094	MG9081	MG9085A
<b>Drives</b>	8 U.2/U.3 NVMe/SAS/SATA	8 U.2 NVMe/SAS/SATA	8 SAS/SATA	8 SAS/SATA	6 SAS/SATA
<b>UBM Channels</b>	Yes, 2/4	No	No	No	No
<b>PCIe Hot-plug SMBus Support</b>	Yes	Yes	No	No	No
<b>VPP/SHP Platform Support</b>	Yes	Yes	No	No	No
<b>SAS Power Disable</b>	Yes	Yes	No	No	No
<b>NVMe/SAS Drive Detect</b>	Yes	Yes	No	No	No
<b>SGPIO Channels</b>	2	2	2	2	1
<b>SGPIO Configurations</b>	32	32	44	30	4
<b>SES-2 (Legacy I2C based)</b>	No	No	No	Yes	Yes
<b>BMC Access through SMBus</b>	Yes	Yes	Yes	No	No
<b>IPMI</b>	No	No	No	Yes	No
<b>IBPI</b>	Yes	Yes	Yes	Yes	Yes
<b>Ready LED Support</b>	Yes	Yes	Yes	Yes	Yes
<b>Global Act &amp; Fail LED</b>	Yes	Yes	Yes	Yes	Yes
<b>USB</b>	No	No	No	Yes	Yes
<b>Internal Voltage Regulator</b>	No	No	Yes	Yes	Yes
<b>Internal Crystal</b>	Yes	Yes	Yes	Yes	Yes
<b>Package</b>	QFN-64	QFN-64	TQFP-48	TQFP-48	LQFP-32

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



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