

MegaRAC® MG9071

SAS/SATA Enclosure Management Controller



AMI's MG9071 Enclosure Management controller provides exceptional flexibility: it can be utilized with both SATA or SAS backplanes for applications from entry-level to mission-critical, while providing a cost effective solution that does not require an expander. The chip implements the most widely used management protocols in the field: SES-2 protocol over I2C and Serial GPIO for SAS and SATA HBAs, supporting LEDs for up to four drives, temperature and fan management.

AMI works with a broad variety of HBA vendors to ensure compatibility.

Data Sheet

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HIGHLIGHTS

- > SGPIO & I2C interface to SAS/SATA HBA
- > Works with any HBA supporting SGPIO or SES-2 protocols over I2C
- > Support for SFF-8448 Rev0.5 interface
- > Each chip can support up to 4 SAS/SATA drives
- > Provides drive Activity, Fail and Locate indication for each drive slot
- > Number of drives supported can easily be increased by a factor of 4 by adding similar chips
- > Supports one 2 wire Temperature sensor
- > Provides Buzzer Control output
- > Supports one Fan Fail & Fan Presence input
- > Tested with numerous platforms
 - SGPIO Platforms:
 - Adaptec
 - LSI
 - Intel ESB2
 - NVIDIA
 - SES Platforms:
 - Adaptec
 - AMCC

Business-critical and telecom applications demand high-availability, which means systems must be operational 99.999% of the time. This implies that the system must be monitored to identify potential failures before they happen and actively prevent them.

Proper environmental management is needed in order to identify potential problems before they cause failures and help pinpoint their locations. Enclosure management requires continuous monitoring of various sensors that detect variations in voltages, temperatures, humidity, fans and the like.

When enclosure monitoring tasks are off-loaded to a lower-cost chip on the backplane, the server main processor is free of ancillary tasks and its usage is focused on mission-critical operations. In other words, efficient enclosure management is key to optimum system performance.

The MG9071 chip manages hot-swap SAS/SATA-II backplanes with enclosure management, ideal for cost-sensitive and performance-oriented system designs. The device is designed to work with any SAS/SATA HBA that supports SES-2 protocol over I2C. Alternatively, each MG 9071 device has one SGPIO port that can communicate enclosure management information to the SAS host bus adapter, support LED management and detect drive presence for up to

four drives.

Serial Attached SCSI (SAS) and Serial ATA are the latest storage interconnect standards, introducing higher speeds, more robust data integrity, smaller designs and wider standardization. The SAS interface is compatible with lower-cost-per-gigabyte SATA drives, giving system builders the flexibility to integrate either SAS or SATA devices while slashing the costs associated with supporting two separate interfaces. As the next generation of SCSI, SAS bridges the parallel technology gap in performance, scalability and affordability.

The SAS interface is designed to be compatible with the Serial ATA (SATA) interface at physical layer level. This allows SAS or SATA drives to be plugged into a SAS backplane, which reduces design and inventory costs for backplane manufacturers.

MG9071 can sync with the backplane to support either SES-2 or SGPIO interface, according to the SFF 8485 Specification rev. 0.7.

The sideband signals defined in SAS/SATA standard can be used to carry SGPIO or 2wire signals depending on Backplane ID and Controller ID.

A backplane required to support only four drives can have just one MG9071. By adding more devices, the backplane can manage 8, 16 drives or more.



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Features

Supported Enclosure Management Protocol

SCSI Enclosure Services-2 (SES-2) Rev.10
SFF-8485 Specification for Serial GPIO (SGPIO)
Bus Revision 0.7

SGPIO

One SGPIO port communicates enclosure management information, LED management and drive presence for up to 4 drives

SF8448 interface signal for SAS

I2C reset from HBA / Serial data output bit stream from initiator
Serial data input bit stream to initiator
I2C Serial clock/clock signal from initiator
I2C Serial Data / Last clock of a bit stream from initiator

Controller type

Managed Elements

Drive Presence
2 LEDs for each slot
1 FAN
1 Buzzer
1 Temperature sensor

Supported Indications

Activity
Fail
Rebuild
Locate

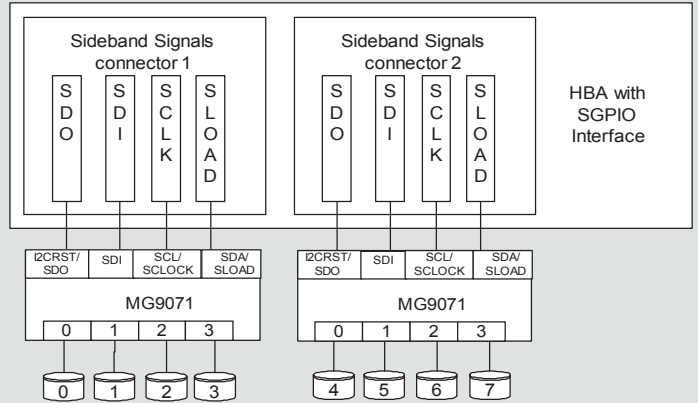
Absolute Maximum Ratings

Operating Temperatures -55oC to +125oC
Storage Temperature -65oC to +150oC
Voltage on any pin except RESET# with respect to ground -1.0V to VCC+0.5V
Voltage on RESET# with respect to ground -1.0 to +13.0V
Maximum operating Voltage 6.00V
DC Current per I/O Pin 40.0mA
DC Current VCC and Ground Pin 200.0mA

VERSATILE: MG 9071 CAN BE USED IN A VARIETY OF DESIGNS

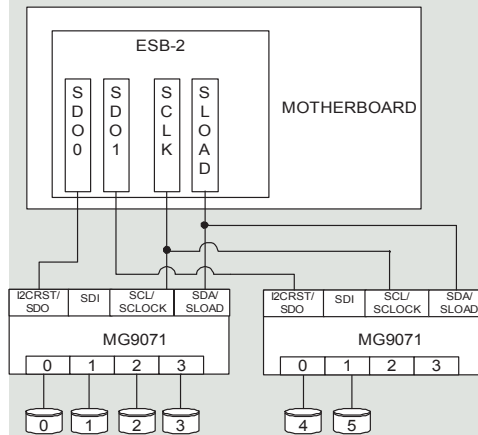
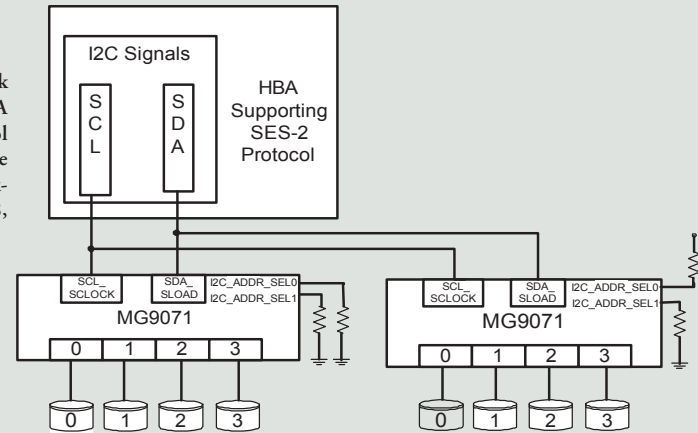
HBA /SGPIO INTERFACE

Each device has one SGPIO port that can communicate enclosure management information to HBAs with SGPIO interface, supporting LED management and drive presence for up to 4 drives. By adding more MG9071 devices, the backplane can be realized for 8, 12, 16 drives or more.



HBA /SES-2 INTERFACE

MG9071 is designed to work with any SAS/SATA HBA that support SES-2 protocol over I2C. By adding more MG9071 devices, the backplane can be realized for 8, 12, 16 drives or more.



ESB2

The block diagram shows the use of MG9071 with an ESB-2 southbridge. By adding more MG9071 devices, the backplane can be realized for 8, 12, 16 drives or more.



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