

## ServeRAID M5120 SAS/SATA Controller

### Product Guide (withdrawn product)

The ServeRAID M5120 SAS/SATA Controller is a 6 Gb SAS RAID controller with two external connectors to connect to SAS expansion enclosures. The adapter is a part of the ServeRAID M5100 Series family, which offers a complete server storage solution consisting of RAID controllers, cache/flash modules, energy packs, and software feature upgrades in an ultra-flexible offerings structure. These products are optimized to deliver performance demanded by the ever-growing I/O requirements of today's enterprises. The M5120 comes as a small form factor PCIe adapter, and it shares a common set of ServeRAID M5100 Series upgrades available for the entire family, simplifying inventory management.

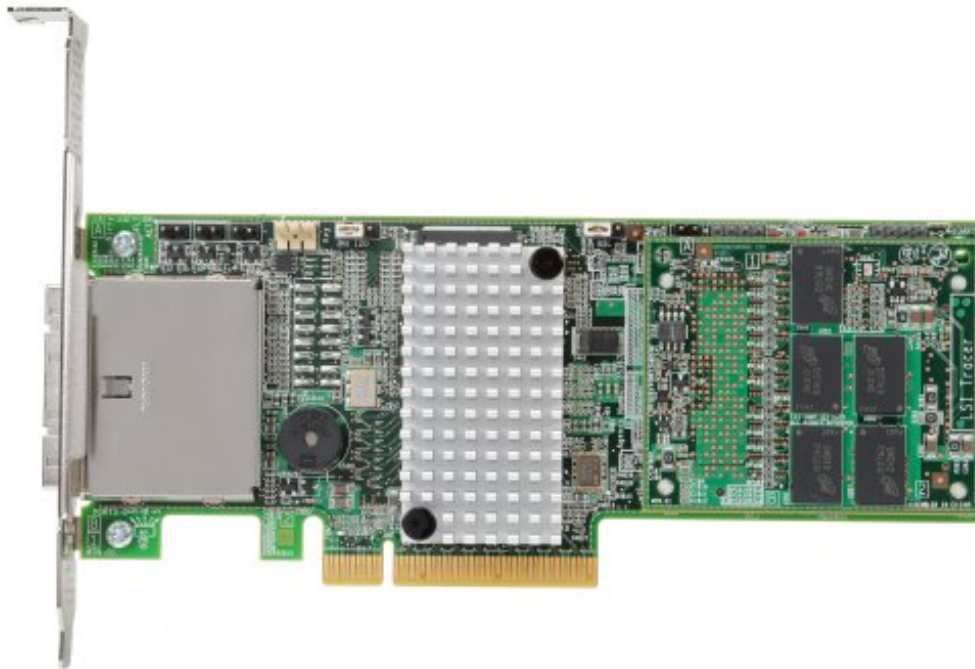


Figure 1. ServeRAID M5120 SAS/SATA Controller (with flash module)

### Did you know?

The ServeRAID M5120 SAS/SATA Controller is optimized for high-performance external data storage with integration of dual-core chip architecture, DDR3 1333 MHz cache memory, and PCIe 3.0 host interface. A portfolio of building blocks allows clients to design around a bottoms-up approach and caters to a wide array of storage requirements. Upgrade features such as support for RAID 6/60, performance optimization, and caching with SSDs no longer require a hardware key. They are implemented through Features-on-Demand (FoD) software licenses.

## Part number information

The following table provides the ordering part numbers and feature codes.

**Withdrawn from marketing:** All part numbers listed in the table below are now withdrawn from marketing

Table 1. Ordering part numbers and feature codes

Description	Part number	Feature code
Base controller		
ServeRAID M5120 SAS/SATA Controller	81Y4478	A1WX
Cache upgrades (required)		
ServeRAID M5100 Series 512MB Cache/RAID 5 Upgrade	81Y4484	A1J3
ServeRAID M5100 Series 512MB Flash/RAID 5 Upgrade	81Y4487	A1J4
ServeRAID M5100 Series 1GB Flash/RAID 5 Upgrade	81Y4559	A1WY
ServeRAID M5100 Series 2GB Flash/RAID 5 Upgrade	47C8670	A4G6
Optional battery kit for 512MB Cache/RAID 5 Upgrade		
ServeRAID M5100 Series Battery Kit	81Y4508	A22E
Features on Demand (FoD) upgrades (optional)**		
ServeRAID M5100 Series RAID 6 Upgrade	81Y4546	A1X3
ServeRAID M5100 Series SSD Performance Accelerator	90Y4273	A2MC
ServeRAID M5100 Series SSD Caching Enabler	90Y4318	A2MD

\*\* One M5100 Series FoD upgrade activates the feature on all M5200 Series and M5100 Series controllers that are installed in the server.

**Cache is required:** The ServeRAID M5120 SAS/SATA Controller ships standard without a cache, however one of the available cache upgrades (81Y4484, 81Y4487, 81Y4559, or 47C8670) is required and must be purchased together with the controller.

The ServeRAID M5120 option part number includes the following items:

- One ServeRAID M5120 adapter card
- Full-height (3U) bracket
- Low-profile (2U) bracket
- Documentation package

The ServeRAID M5100 Series 512MB Cache Upgrade option part number includes the following items:

- Cache module
- Documentation package

The ServeRAID M5100 Series Battery Kit option part number includes the following items:

- Battery
- Two battery cables (0.5 m and 0.95 m)
- Documentation package

ServeRAID M5100 Series 512MB, 1GB, and 2GB Flash Upgrade option part numbers include the following items:

- Cache module
- Flash power module
- Two power module cable
- Documentation package

ServeRAID M5100 Series RAID 6 Upgrade, SSD Performance Accelerator, and SSD Caching Enabler option part numbers include the following items:

- M5100 Series upgrade authorization letter
- Feature Activation Instructions

Figure 2 shows the Flash-backed cache module, power module, and power cable.

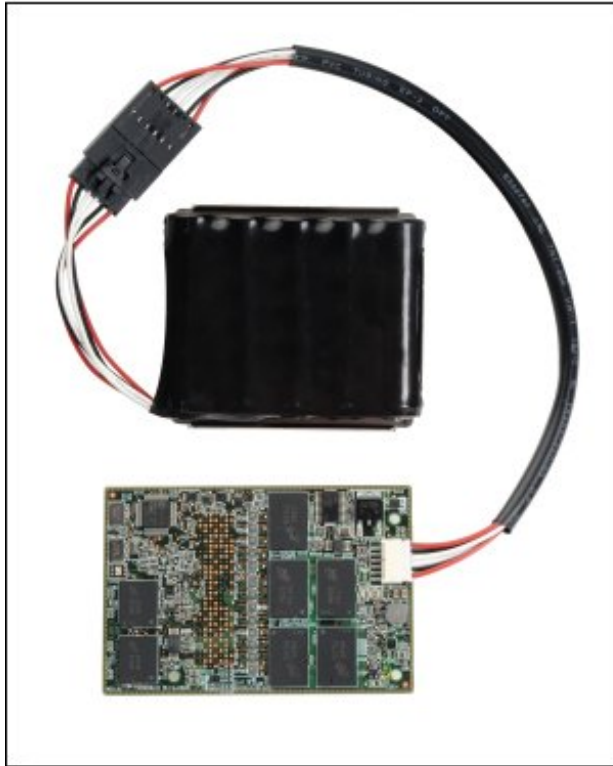


Figure 2. Flash-backed cache module, power module, and power cable

## Features

The ServeRAID M5120 SAS/SATA Controller has the following standard features:

- Auto-resume on array rebuild or array reconstruction after loss of system power  
Auto-resume uses non-volatile NVRAM to save rebuild progress during a host reboot or power failure to automatically resume from the last checkpoint. Auto-resume ensures that data integrity is maintained through the process. The card supports a number of features that are able to be implemented without rebooting the server. Applications such as email and web server benefit from avoiding downtime during transition.
- Online Capacity Expansion  
Online Capacity Expansion (OCE) allows the capacity of a virtual disk to be expanded by adding new physical disks or making use of unused space on existing disks, without requiring a reboot.
- Online RAID Level Migration  
Online RAID Level Migration (also known as logical drive migration) provides the ability to migrate a virtual disk from any RAID level to any other RAID level without requiring a reboot. System availability and application functionality remain unaffected.

- **Fast initialization for quick array setup**  
Fast initialization quickly writes zeroes to the first and last sectors of the virtual drive. This allows you to immediately start writing data to the virtual drive while the initialization is running in the background.
- **Consistency check for background data integrity**  
Consistency check verifies that all stripes in a virtual disk with a redundant RAID level are consistent. The consistency check will mirror data when an inconsistent stripe is detected for a RAID 1 and recreate the parity from the peer disks in the case of a RAID 5 or RAID 6. Consistency checks can be scheduled to take place periodically.
- **Extensive online configuration options and advanced monitoring and event notification**  
Management tools provide convenience for configuration of logical volumes and alerting when errors have occurred or are about to occur.
- **Patrol read for media scanning and repairing**  
Patrol read is a background sentry service designed to proactively discover and correct media defects (bad sectors) that arise normally as a disk drive ages. The service issues a series of verify commands, and if a bad block is discovered, the card's firmware uses RAID algorithms to recreate the missing data and remap the sector to a good sector. The task is interruptible based on controller activity and host operations. The firmware also provides an interface where the patrol read task can be initiated, set up for continuous operation, and terminated from a management application. Patrol read can be activated by manual command or automatically.
- **Global and dedicated Hot Spare with Revertible Hot Spare support**  
A hot spare rebuilds data from all virtual disks within the disk group in which it is configured. ServeRAID provides the ability to define a physical disk as a hot spare to replace a failed drive. Hot spares can be configured as either global or dedicated. A global hot spare allows any physical drive to be designated as a hot spare. A dedicated hot spare allows the user to assign a hot spare drive to a particular array of the same drive type.
- **Single controller multipathing (failover) I/O load balancing**  
The ServeRAID's firmware detects and uses multiple paths from the controllers to the SAS drives that are in enclosures. With redundant paths to the same port of a device, if one path fails, another path can be used to communicate between the controller and the drive. Using multiple paths with load balancing, instead of a single path, can increase reliability through redundancy.
- **WebBIOS configuration utility for pre-boot array configuration and management**  
WebBIOS is a utility built into the ServeRAID controller that allows you to configure drive groups and logical drives before installing or booting the operating system.
- **MegaRAID Storage Manager management software**  
MegaRAID Storage Manager is an easy-to-use advanced RAID management application used across the entire family of ServeRAID M controllers. It allows you to configure, monitor, and maintain drive groups, virtual drives, and advanced features with an intuitive GUI, reducing administrative efforts and simplifying troubleshooting.

**Note:** RAID 10, 50 and 60 drive groups do not support Online Capacity Expansion and Online RAID Level Migration. RAID 0, 1, 5, and 6 drive groups do not support Online Capacity Expansion and Online RAID Level Migration if two or more virtual drives are defined on a single drive group.

The following features are not included in the and require respective upgrade to be purchased:

- Support for RAID levels 6 and 60 with M5100 Series RAID 6 Upgrade (81Y4546).  
This is a Features on Demand upgrade and one upgrade is needed per server; all M5100 and M5200 series adapters installed in the server will have this upgrade enabled automatically.

- MegaRAID SafeStore support for self-encrypting drive (SED) services

MegaRAID SafeStore encryption services offer instant secure erase and local key management for self-encrypting drives. This technology represents a significant step forward in securing data on a disk drive from any unauthorized access or modification resulting from theft, loss, or repurposing of drives. Instant secure erase permanently removes data when repurposing or decommissioning SEDs.

SafeStore local key management provides the necessary management and protection of SEDs using a simple pass phrase, security key identifier, and security key file that can be set and applied to all SEDs assigned to a ServeRAID adapter. This removes the complexity of managing each SED's unique encryption key, and essentially relieves the administrator of most of the daily tasks of securing data.

The SafeStore is a part of any RAID 5 upgrade available: 81Y4484, 81Y4487, 81Y4559, or 47C8670.

- MegaRAID flash cache protection

MegaRAID flash cache protection uses NAND flash memory powered by a supercapacitor to protect data stored in the controller cache. This module eliminates the need for a lithium-ion battery commonly used to protect DRAM cache memory on PCI RAID controllers. To avoid the possibility of data loss or corruption during a power or server failure, flash cache protection technology transfers the contents of the DRAM cache to NAND flash using power from the flash power module. After the power is restored to the RAID controller, flash protection technology transfers the contents of the NAND flash back to the DRAM, which will eventually be flushed to disk.

- MegaRAID FastPath SSD performance acceleration

This feature is activated by enabling M5100 Series Performance Accelerator upgrade (90Y4273). MegaRAID FastPath software provides high-performance I/O acceleration for SSD-based virtual drives by exploiting an extremely low latency I/O path to increase the maximum IOPS capability of the controller. This feature boosts performance of applications with highly random data storage access patterns like transactional databases.

M5100 Series Performance Accelerator is a Features on Demand upgrade and one upgrade is needed per server; all M5100 and M5200 series adapters installed in the server will have this upgrade enabled automatically.

- MegaRAID CacheCade SSD caching for traditional hard drives

This feature is activated by enabling M5100 Series SSD Caching Enabler upgrade (90Y4318). MegaRAID CacheCade read/write software is designed to accelerate the performance of hard disk drive (HDD) arrays with only an incremental investment in solid state drive (SSD) technology. The software enables SSDs to be configured as a dedicated pool of controller cache to help maximize I/O performance for transaction-intensive applications like databases and web serving. CacheCade software tracks data storage access patterns and identifies the most frequently accessed data. This hot data is then automatically stored on the solid state storage devices assigned as a dedicated cache pool on a ServeRAID controller.

M5100 Series SSD Caching Enabler is a Features on Demand upgrade and one upgrade is needed per server; all M5100 and M5200 series adapters installed in the server will have this upgrade enabled automatically.

## Technical specifications

The ServeRAID M5120 SAS/SATA Controller has the following specifications:

- PCI Low Profile, Half-length - MD2 form factor
- Eight external 6 Gbps SAS/SATA ports
- Two external Mini-SAS connectors (SFF-8088)
- 6 Gbps throughput per port
- 800 MHz dual-core IBM PowerPC® processor with LSI SAS2208 6 Gbps RAID on Chip (ROC) controller
- PCI Express 3.0 x8 host interface
- Onboard data cache (DDR3 running at 1333 MHz) required for M5120 operations (does not come standard, must be purchased in addition to M5120) with the choice of:
  - 512 MB with optional battery backup
  - 512 MB, 1 GB, or 2 GB with flash backup (MegaRAID flash cache protection technology)
- Support for RAID levels 0, 1, 10, 5, and 50 (with required cache module); support for RAID 6, 60 with additional FoD upgrade
- Supports SAS, SATA HDDs, and SSDs
- Intermix of SAS and SATA HDDs and SSDs is supported, but the mixing of different drives type in the same array (drive group) is not recommended
- Connects to up to 240 external drives
- Supports connections to EXP2512 and EXP2524 external expansion enclosures
- Optional support for self-encrypting drives (SEDs) with MegaRAID SafeStore
- Optional support for SSD performance acceleration with MegaRAID FastPath and SSD caching with MegaRAID CacheCade
- Supports up to 64 virtual drives, up to 128 drive groups, up to 16 virtual drives per one drive group, and up to 32 physical drives per one drive group
- Supports LUN sizes up to 64 TB
- Configurable stripe size up to 1 MB
- Compliant with Disk Data Format (DDF) configuration on disk (COD)
- S.M.A.R.T. support
- MegaRAID Storage Manager management software

## Feature upgrade matrix

The ServeRAID M5120 SAS/SATA Controller ships standard without a cache. One of the available cache upgrades listed in the following table is required for the M5120 adapter operations, and it must be purchased together with the controller. Additional functional upgrades optionally are available to expand the capabilities of M5120.

There are two types of upgrades available: hardware (HW) and Feature-on-Demand (FoD). Hardware upgrades contain physical parts (for example, cache module or battery), whereas FoD upgrades are software licenses. The following table lists cache upgrades available and their capabilities and types.

Table 2. ServeRAID M5120 cache upgrades and their features

Feature			RAID 5, 50	SED	512 MB DDR3 cache	1 GB DDR3 cache	2 GB DDR3 cache	Flash-backed cache
Option description	Part number	Type						
ServeRAID M5100 Series 512MB Cache/RAID 5 Upgrade	81Y4484	HW	Yes	Yes	Yes	No	No	No
ServeRAID M5100 Series 512MB Flash/RAID 5 Upgrade	81Y4487	HW	Yes	Yes	Yes	No	No	Yes
ServeRAID M5100 Series 1GB Flash/RAID 5 Upgrade	81Y4559	HW	Yes	Yes	No	Yes	No	Yes
ServeRAID M5100 Series 2GB Flash/RAID 5 Upgrade	47C8670	HW	Yes	Yes	No	No	Yes	Yes

**Zero Cache/RAID 5 Upgrade:** ServeRAID M5100 Series Zero Cache/RAID 5 Upgrade (81Y4544) is not supported on the M5120 adapter.

The following table shows additional upgrades, their capabilities, types, and compatibility with cache upgrades. In the table below, "Required" means that the cache upgrade listed in the column must be enabled before enabling the additional feature listed in that particular row.

Table 3. ServeRAID M5120 additional upgrades, their features, and compatibility

Cache upgrades		Option description		512 MB Cache/RAID 5	512 MB Flash/RAID 5	1 GB Flash/RAID 5	2 GB Flash/RAID 5
Additional feature upgrades		Part number	Upgrade type	81Y4484	81Y4487	81Y4559	47C8670
Feature	Option description	Part number	Type				
Battery-backed cache	Battery Kit	81Y4508	HW	Required	No support	No support	No support
RAID 6, 60	RAID 6 Upgrade	81Y4546	FoD	Required	Required	Required	Required
FastPath	SSD Performance Accelerator	90Y4273	FoD	Required	Required	Required	Required
CacheCade	SSD Caching Enabler	90Y4318	FoD	Required	Required	Required	Required

## Server support

The ServeRAID M5120 adapter card is supported on the System x and iDataPlex® servers listed in the following table.

**Support for System x and dense servers with Xeon E5/E7 v4 and E3 v5 processors**

Table 4. Support for System x and dense servers with Xeon E5/E7 v4 and E3 v5 processors

Part number	Description	x3250 M6 (3943)	x3250 M6 (3633)	x3550 M5 (8869)	x3650 M5 (8871)	x3850 X6/x3950 X6 (6241, E7 v4)	inx360 M5 (5465, E5-2600 v4)	sd350 (5493)
81Y4478	ServeRAID M5120 SAS/SATA Controller	N	N	N	N	N	N	N
81Y4544	ServeRAID M5100 Series Zero Cache/RAID 5 Upgrade	N	N	N	N	N	N	N
81Y4484	ServeRAID M5100 Series 512MB Cache/RAID 5 Upgrade	N	N	N	N	N	N	N
81Y4487	ServeRAID M5100 Series 512MB Flash/RAID 5 Upgrade	N	N	N	N	N	N	N
81Y4559	ServeRAID M5100 Series 1GB Flash/RAID 5 Upgrade	N	N	N	N	N	N	N
47C8670	ServeRAID M5100 Series 2GB Flash/RAID 5 Upgrade	N	N	N	N	N	N	N
81Y4508	ServeRAID M5100 Series Battery Kit	N	N	N	N	N	N	N
81Y4546	ServeRAID M5100 Series RAID 6 Upgrade	N	N	N	N	N	N	N
90Y4273	ServeRAID M5100 Series SSD Performance Key	N	N	N	N	N	N	N
90Y4318	ServeRAID M5100 Series SSD Caching Enabler	N	N	N	N	N	N	N



## Support for System x and dense servers with Intel Xeon v3 processors

Table 5. Support for servers with Intel Xeon v3 processors

Part number	Description	x3100 M5 (5457)	x3250 M5 (5458)	x3500 M5 (5464)	x3550 M5 (5463)	x3650 M5 (5462)	x3850 X6/x3950 X6 (6241, E7 v3)	nx360 M5 (5465)
81Y4478	ServeRAID M5120 SAS/SATA Controller	Y	Y	N	N	N	Y	N
81Y4544	ServeRAID M5100 Series Zero Cache/RAID 5 Upgrade	Y	Y	N	N	N	N	N
81Y4484	ServeRAID M5100 Series 512MB Cache/RAID 5 Upgrade	Y	Y	N	N	N	N	N
81Y4487	ServeRAID M5100 Series 512MB Flash/RAID 5 Upgrade	Y	Y	N	N	N	Y	N
81Y4559	ServeRAID M5100 Series 1GB Flash/RAID 5 Upgrade	Y	Y	N	N	N	Y	N
47C8670	ServeRAID M5100 Series 2GB Flash/RAID 5 Upgrade	N	N	N	N	N	Y	N
81Y4508	ServeRAID M5100 Series Battery Kit	Y	Y	N	N	N	N	N
81Y4546	ServeRAID M5100 Series RAID 6 Upgrade	Y	Y	N	N	N	Y	N
90Y4273	ServeRAID M5100 Series SSD Performance Key	Y	Y	N	N	N	Y	N
90Y4318	ServeRAID M5100 Series SSD Caching Enabler	Y	Y	N	N	N	Y	N

## Support for servers with Intel Xeon v2 processors

Table 6. Support for servers with Intel Xeon v2 processors

Part number	Description	x3300 M4 (7382)	x3500 M4 (7383, E5-2600 v2)	x3550 M4 (7914, E5-2600 v2)	x3630 M4 (7158, E5-2400 v2)	x3650 M4 (7915, E5-2600 v2)	x3650 M4 BD (5466)	x3750 M4 (8753)	x3850 X6/x3950 X6 (6241, E7 v2)
81Y4478	ServeRAID M5120 SAS/SATA Controller	Y	Y	Y	Y	Y	Y	Y	Y
81Y4544	ServeRAID M5100 Series Zero Cache/RAID 5 Upgrade	Y	Y	Y	Y	Y	Y	N	N
81Y4484	ServeRAID M5100 Series 512MB Cache/RAID 5 Upgrade	Y	Y	Y	Y	Y	Y	N	N
81Y4487	ServeRAID M5100 Series 512MB Flash/RAID 5 Upgrade	Y	Y	Y	Y	Y	Y	Y	Y
81Y4559	ServeRAID M5100 Series 1GB Flash/RAID 5 Upgrade	Y	Y	Y	Y	Y	Y	Y	Y
47C8670	ServeRAID M5100 Series 2GB Flash/RAID 5 Upgrade	Y	Y	Y	Y	Y	Y	Y	Y
81Y4508	ServeRAID M5100 Series Battery Kit	Y	Y	Y	Y	Y	Y	N	N
81Y4546	ServeRAID M5100 Series RAID 6 Upgrade	Y	Y	Y	Y	Y	Y	Y	Y
90Y4273	ServeRAID M5100 Series SSD Performance Key	Y	Y	Y	Y	Y	Y	Y	Y
90Y4318	ServeRAID M5100 Series SSD Caching Enabler	Y	Y	Y	Y	Y	Y	Y	Y

See the ServerProven® website for the latest information about the System x servers that support each adapter: <http://www.lenovo.com/us/en/serverproven/>

## Expansion enclosures and drives

The ServeRAID M5120 SAS/SATA Controller supports connectivity to the external expansion enclosures listed in the following table.

Table 7. External expansion enclosures

<b>Part number</b>	<b>Description</b>	<b>Maximum supported per one M5120</b>
64111B1*	Lenovo Storage E1012 LFF Disk Expansion Single SAS IO Module, Rail Kit, 9x5 NBD	8
64111B2	Lenovo Storage E1012 LFF Disk Expansion Dual SAS IO Module, Rail Kit, 9x5 NBD	4
64111B3*	Lenovo Storage E1024 SFF Disk Expansion Single SAS IO Module, Rail Kit, 9x5 NBD	8
64111B4	Lenovo Storage E1024 SFF Disk Expansion Dual SAS IO Module, Rail Kit, 9x5 NBD	4

\* Not available for ordering in North America (United States and Canada).

For details about supported adapters, drives and cables for the Lenovo Storage E1012 and E1024, see the Lenovo Press Product Guide:

<http://lenovopress.com/lp0043>

## Operating system support

The adapter supports the following operating systems:

**Tip:** This table is automatically generated based on data from [Lenovo ServerProven](#). Note that older servers are not listed. Visit ServerProven to view OS support for those servers.

Table 8. Operating system support for ServeRAID M5120 SAS/SATA Controller, 81Y4478

Operating systems	x3850/3950 X6 (3837)	x3850/3950 X6 (6241, E7 v2)	x3850/3950 X6 (6241, E7 v3)	x3850/3950 X6 (6241, E7 v4)	x3100 M5 (5457)	x3250 M5 (5458)
Microsoft Windows Server 2008 R2	Y	Y	Y	N	Y	Y
Microsoft Windows Server 2012	Y	Y	Y	Y	Y	Y
Microsoft Windows Server 2012 R2	Y	Y	Y	Y	Y	Y
Microsoft Windows Server 2016	N	Y <sup>1</sup>	Y <sup>1</sup>	Y <sup>1</sup>	Y	Y
Microsoft Windows Server 2019	N	N	N	Y	N	N
Microsoft Windows Server version 1709	N	N	Y	Y	N	N
Red Hat Enterprise Linux 5 Server with Xen x64 Edition	N	N	N	N	N	Y
Red Hat Enterprise Linux 5 Server x64 Edition	N	N	N	N	Y	Y
Red Hat Enterprise Linux 6 Server x64 Edition	Y	Y	Y	Y	N	Y
Red Hat Enterprise Linux 7	N	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 8.0	N	N	N	Y	N	N
SUSE Linux Enterprise Server 11 for AMD64/EM64T	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 11 for x86	N	N	N	N	Y	Y
SUSE Linux Enterprise Server 11 with Xen for AMD64/EM64T	Y	Y	Y	Y	N	Y
SUSE Linux Enterprise Server 12	N	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 12 with Xen	N	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15	N	N	Y	Y	N	N
SUSE Linux Enterprise Server 15 with Xen	N	N	Y	Y	N	N
VMware vSphere 5.1 (ESXi)	Y	Y	N	N	Y	Y
VMware vSphere Hypervisor (ESXi) 5.5	Y	Y	Y	N	Y	Y
VMware vSphere Hypervisor (ESXi) 6.0	Y	Y	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 6.5	Y	N	Y	Y	N	Y
VMware vSphere Hypervisor (ESXi) 6.7	N	N	N	Y	N	N

<sup>1</sup> [in box driver support only]

## Warranty

The ServeRAID M5120 SAS/SATA Controller carries a 1-year limited warranty. When installed in a supported System x server, the adapter assumes the system's base warranty and any warranty upgrades.

## Physical specifications

The ServeRAID M5120 SAS/SATA Controller has the following physical specifications:

Dimensions (approximate):

- Height: 15 mm (0.6 in)
- Width: 69 mm (2.7 in)
- Depth: 168 mm (6.6 in)
- Weight: 77 g (0.2 lb)

Shipping dimensions (approximate):

- Height: 51 mm (2.0 in)
- Width: 143.0 mm (5.6 in)
- Depth: 238 mm (9.4 in)
- Weight: 222 g (0.5 lb)

## Operating environment

The ServeRAID M5120 SAS/SATA Controller is supported in the following environment:

- Temperature
  - 10 - 35 °C (50 - 95 °F) at 0 - 914 m (0 - 3,000 ft)
  - 10 - 32 °C (50 - 90 °F) at 914 - 2,133 m (3,000 - 7,000 ft)
- Relative humidity: 20 to 80% (noncondensing)
- Maximum altitude: 2,133 m ( 7,000 ft)

## Agency approvals

The adapter conforms to the following regulations:

- EN55022
- EN55024
- EN60950 / CE
- EN 61000-3-2
- EN 61000-3-3
- IEC 950 CB Scheme
- FCC Part 15 Class A and Class B
- UL 1950
- CSA C22.2 950-95
- VCCI
- NZ AS3548 / C-tick
- RRL for MIC (KCC)
- BSMI
- UL 94-IV

## Related publications and links

For more information see the following documents:

- Lenovo System x storage options product web page  
<https://www3.lenovo.com/us/en/data-center/servers/server-options/system-x-options/server-storage/c/system-x-storage>
- ServeRAID M5120 User's Guide  
<https://support.lenovo.com/docs/UM104022>
- Quick Installation Guide for ServeRAID M5100 Series Battery Kit  
<https://support.lenovo.com/us/en/docs/UM104005>
- Lenovo RAID Introduction  
<https://lenovopress.com/lp0578-lenovo-raid-introduction>
- Lenovo RAID Management Tools and Resources (includes links to drivers and management tools)  
<https://lenovopress.com/lp0579-lenovo-raid-management-tools-and-resources>
- System x Configuration and Options Guide  
<https://support.lenovo.com/us/en/documents/SCOD-3ZVQ5W>
- US Announcement Letter  
<http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=897/ENUS112-048>

## Related product families

Product families related to this document are the following:

- [RAID Adapters](#)

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This document, TIPS0858, was created or updated on March 20, 2019.

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