Overview

**HP Smart Array P840 Controller**

The HP Smart Array P840 Controller is a full height, PCIe3 x8, 12Gb/s SAS RAID controller that provides enterprise-class storage performance, increased internal scalability, and data protection for HP ProLiant Gen9 rack and tower servers. It features 16 internal physical links and delivers increased server uptime by providing advanced storage functionality, including online RAID level migration between any RAID levels with FBWC, global online spare, and pre-failure warning. This controller supports 16 drives without need for the SAS Expander Card providing point to point connectivity to SSDs for lower latency. This controller has transportable FBWC allowing the data in the cache to be migrated to a new controller.

The Gen9 controllers support the HP Smart Storage Battery that allows multiple Smart Array controllers to be supported, resulting in simple upgrade process.

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**Models**

<table>
<thead>
<tr>
<th>HP Smart Array P840 Controller</th>
<th>HP Smart Array P840/4GB FBWC 12Gb 2-ports Int SAS Controller</th>
<th>726897-B21</th>
</tr>
</thead>
</table>

**NOTE:** HP Smart Array P840/4GB FBWC controller option kit does not include the HP Smart Storage Battery the backup power source necessary to protect the data on the Flash-backed Write Cache. HP Smart Storage Battery is an item that has to be purchased separately if this is the first P-series Smart Array controller on your Gen9 server.
QuickSpecs

HP Smart Array P840 Controller

Standard Features

The Smart Array Advantage

HP's innovative design and integration work of the Smart Array family of products creates customer value that is unmatched in the industry. Use of Smart Array products across multiple applications results in a much lower Total Cost of Ownership (TCO) than any other server storage RAID product. The HP Smart Array family brings an unparalleled return on investment through:

Data Compatibility among all models of Smart Array controllers allows simple and easy upgrades any time needs for higher performance, capacity, and availability increase. Even successive generations of Smart Array controllers understand the data format of other Smart Array Controllers.

Consistent Configuration and Management Tools. Most current shipping Smart Array products utilize a standard set of management and utility software. These tools minimize Total Cost of Ownership (TCO) by reducing training requirements and technical expertise necessary to install and maintain the HP server storage.

Smart Carrier is used across multiple HP Servers. With compatibility across many enterprise platforms, you are free to deploy and re-deploy these drives to quickly deliver increased storage capacity, migrate data between systems, and easily manage spare drives.

Pre-Failure Warranty means HP Insight Manager not only reports when a drive is going to fail but allows replacement of failing drives prior to actual failure. For complete details, consult the HP Support Center or refer to your HP Server documentation.

Key Features

- The P840 Controller supports up to 16 drives without need for expander card. For example, DL38x Gen9 server that comes standard with 8 SFF drives cage can be expanded to additional 8 SFF drive cage connected to Smart Array P840
- Seamless upgrades to and from other HP Smart Array controllers.
- 16 SAS/SATA physical links distributed across 2 double wide Mini SAS 8i connectors for attachment to internal drive backplanes
- 12Gb/s SAS performance when used on Gen9 servers with 12Gb/s devices (HDD or SSD)
- 12Gb/s SAS technology delivers up to 1200 MB/s per physical link.
- 6Gb/s SATA technology delivers up to 600 MB/s for directly attached SATA drives.
- Mix-and-match SAS and SATA drives. Deploy drive technology as needed to fit the computing environment.
- PCI-e 3.0 8x host interface provides up to 8GiB/s in each direction
- 4GB transportable Flash-backed write cache (not all of which is available for user data)
- Standard on the P840 are RAID 6 ADG, RAID 60 ADG, RAID 1 ADM, Capacity Expansion, mirror split, recombine, and rollback in Online Mode, Drive Erase, Performance Optimization-Degraded Reads and Read Coalescing, Move/Delete any individual LUNS and Online Split Mirror.
- Capable of supporting both legacy and UEFI boot operation on Gen9 servers
- Recovery ROM protects against ROM corruption
- The HP SSD Smart Path feature included in the Smart Array software stack improves SSD read for all RAID levels and RAID 0 write operations by optimizing the path to each SSD attached to the controller.
- The HP SmartCache feature (already included with the P840 controller) is a controller-based read and write caching solution in a DAS environment that caches the most frequently accessed data (“hot” data) onto lower latency SSDs to dynamically accelerate application workloads.
- The HP Secure Encryption, available as an option, is a Smart Array controller-based data encryption solution for ProLiant Gen9 servers that protect sensitive, mission critical data.
- Consistent management software among most current shipping HP Smart Array products, including HP Smart Storage Administrator (HP SSA), Systems Insight Manager (SIM), Array Diagnostic Utility (ADU), and Intelligent Provisioning
- HBA or RAID mode
- Power efficiency
- Rapid rebuild
QuickSpecs

HP Smart Array P840 Controller

Standard Features

Ports
- 16 SAS/SATA physical links distributed across 2 double wide Mini SAS 8i connectors

Performance
- 12Gb/s SAS (1200 MB/s theoretical bandwidth per physical lane)
- 4 GiBytes 72-bit wide DDR3-1866 Flash Back Write Cache provides up to 14.9GB/s maximum cache bandwidth
- PCI Express Gen3 x8 link width
- Read ahead caching
- Write-back caching

RAID Levels
- **RAID 6** (Advanced Data Guarding): Supported with a minimum of 4 drives. This allocates two sets of parity data across drives. This level of fault tolerance can withstand a double drive failure without downtime or data loss.
- **RAID 60**: Supported with a minimum of 8 drives. This volume is composed of two or more RAID 6 sub-volumes (parity groups) where data is striped across each parity group as if it were a single physical drive. Each RAID 6 parity group can sustain up to two drive failures without incurring data loss.
- **RAID 5** (Distributed Data Guarding): Supported with a minimum of 3 drives. This allocates one set of parity data across drives. This level of fault tolerance can withstand a single drive failure without downtime or data loss.
- **RAID 50**: Supported with a minimum of 6 drives. This volume is composed of two or more RAID 5 sub-volumes (parity groups) where data is striped across each parity group as if it were a single physical drive. Each RAID 5 parity group can sustain a single drive failure without incurring data loss.
- **RAID 1 & 10** (Drive Mirroring): Supported with a minimum of 2 drives. This allocates half of the drive array to the data and the other half to the mirrored data, providing two copies of the data.
- **RAID 1 ADM & 10 ADM** (Advanced Data Mirroring): Supported with a minimum of 3 drives. RAID 1 ADM creates redundant copies of the data using 3 drives. RAID 10 ADM stripes data across two or more sets of RAID 1 ADM volumes. This level of fault tolerance can withstand a double drive failure within a RAID 1 ADM volume without downtime or data loss.

Online Management Features
- Online array expansion
- Online capacity expansion
- Online logical drive extension
- Online RAID level migration
- Online stripe size migration
- Online mirror split, recombine and rollback
- Online and high performance offline Rapid Parity Initialization (RPI)
- Unlimited global online spare assignment
- User selectable expand and rebuild priority
- User selectable RAID level and stripe size
- User selectable read and write cache sizes
- Supports Predictive Spare Activation

Availability
Provides increased server uptime by providing advanced storage functionality:
- Online RAID level migration between any RAID levels
- Online stripe size migration
- Online capacity expansion
- Online logical drive extension
- Online active drive replacement
- Online drive firmware upgrade
- Unlimited global online spare
Fault Prevention

The following features offer detection of possible failures before they occur, allowing preventive action to be taken:

- S.M.A.R.T.: Self Monitoring Analysis and Reporting Technology first developed at HP detects possible hard disk failure before it occurs, allowing replacement of the component before failure occurs.
- Drive Parameter Tracking monitors drive operational parameters, predicting failure and notifying the administrator.
- Dynamic Sector Repairing continually performs background surface scans on the hard disk drives during inactive periods and automatically remaps bad sectors, ensuring data integrity.
- Smart Array Cache Tracking monitors integrity of controller cache, allowing pre-failure preventative maintenance.

Fault Recovery

Minimizes downtime, reconstructs data, and facilitates a quick recovery from drive failure

- Recovery ROM: This feature provides unique redundancy that protects from a ROM image corruption. A new version of firmware can be flashed to the ROM while the controller maintains the last known working version of firmware. If the firmware becomes corrupt, the controller will revert back to the previous version of firmware and continue operating. This reduces the risk of flashing firmware to the controller.
- On-Line Spares: There is no limit to the number of spare drives that can be installed prior to drive failure. If a failure occurs, recovery begins with an On-Line Spare and data is reconstructed automatically.
- DRAM ECC corrects against single bit data and address corruption.

Ease of Use

Consistency and Upgradeability on most current shipping Smart Array products make them unique in the industry:

- GUI based configuration, management and diagnostic software tools with the HP Smart Storage Administrator
- Common data format between generations of products
- Data migration between servers and external Modular Smart Array enclosures

HP SSD SmartPath

The HP SSD Smart Path feature included in the Smart Array software stack improves Solid State Disk (SSD) read performance. With up to 4x better SSD read performance, HP SSD Smart Path chooses the optimum path to the SSD and accelerates reads for all RAID levels and RAID 0 writes. HP SSD Smart Path requires updated firmware, drivers, and configuration utility available at: [http://www.hp.com/go/hpssa](http://www.hp.com/go/hpssa).

HP SSD Smart Path is ideal for read intensive workloads and is included as a base feature on HP Smart Array P-series controllers. The following operating systems are supported by the HP SSD Smart Path feature:

- Microsoft Windows Server 2008
- Microsoft Windows Server 2008 R2
- Microsoft Windows Server 2012
- Red Hat Enterprise Linux 6.5
- SUSE Linux Enterprise Server 11 (SP1, SP2, SP3)
- VMware ESXi 5.0 u3
- VMware vSphere 5.1u2 and vSphere 5.5

HP SmartCache

The HP SmartCache feature is a controller-based read and write caching solution in a DAS environment that caches the most frequently accessed data (“hot” data) onto lower latency SSDs to dynamically accelerate application workloads. The HP SmartCache architecture is flexible and supports any HP
ProLiant Gen9 supported HDD for bulk storage and any HP ProLiant Gen8 supported SSD as an accelerator.

HP SmartCache is deployed and managed using the HP SmartStorage Administrator (HP SSA).

The basic HP SmartCache architecture is comprised of the following three elements:

- **Bulk storage**: The first element is the bulk storage device, which is any supported HDD attached to the HP Smart Array controller.
- **Accelerator**: The second element, the accelerator, is a faster/lower latency SSD device that caches data.
- **Metadata**: The final element is metadata, information held in the FBWC that maps the location of information residing on the accelerator and bulk storage devices.

For more information please visit: [http://www.hp.com/go/smartcache](http://www.hp.com/go/smartcache)

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**HP Secure Encryption**

HP Secure Encryption is a Smart Array controller-based data encryption solution for ProLiant Gen9 servers that protects sensitive, mission critical data. This is an enterprise-class encryption solution for data at rest on any bulk storage attached (with the exception of tape or external arrays such as P2000 or MSA 2040) to the supported HP Smart Array Px4 family of controllers including data on the cache of the controller.

The solution is available for both local and remote deployments. Local Key Management Mode is focused on single server deployment where there is one Master key per controller that is managed by the user. All volumes still have their own unique key(s) for data encryption. Remote Key Management Mode is for enterprise wide deployments and requires HP Integrated Lights Out (iLO) Advanced or Scale Out editions v2.0 or later and HP Enterprise Secure Key Manager (ESKM) 3.1 or any later release. The HP ESKM manages all the encryption deployments from just a few servers to thousands of servers and 2 million keys per HP ESKM 3.1 cluster.

For more information please visit: [http://www.hp.com/go/hpsecureencryption](http://www.hp.com/go/hpsecureencryption)

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**Warranty**

The warranty for this device is 3 years parts only.

**Pre-Failure Warranty**: Drives attached to the Smart Array Controller and monitored under Insight Manager are supported by a Pre-Failure (replacement) Warranty. For complete details, consult the HP Support Center or refer to your HP Server Documentation.

**Warranty Upgrade Options**

- Response - Upgrade on-site response from next business day to same day 4 hours
- Coverage - Extend hours of coverage from 9 hours x 5 days to 24 hours x 7 days
- Duration - Select duration of coverage for a period of 1, 3, or 5 years
- Warranty upgrade options can come in the form of Care Packs, which are sold at the HP System level this product attaches too
QuickSpecs
HP Smart Array P840 Controller

Compatibility

**Server Support**
For up to date compatibility, please see the following URL for complete Smart Array Controller compatibility and support information: [http://www.hp.com/go/smartarray](http://www.hp.com/go/smartarray)

**Operating Systems**
- Microsoft Windows Server 2012 R2
- Microsoft Windows Server 2012
- Microsoft Windows Server 2008 R2
- Microsoft Windows Hyper-V 2012
- Microsoft Windows Hyper-V 2008
- Red Hat Enterprise Linux 7
- Red Hat Enterprise Linux 6 U5
- SUSE Linux Enterprise Server 11 SP3
- SUSE Linux Enterprise Server 12 (support pending)
- Canonical Ubuntu 14.04*
- Canonical Ubuntu 12.04*
- Solaris 11.1*
- VMware ESXi 5.0 U2
- VMware ESXi 5.1 U1
- VMware vSphere 5.5

**NOTE:** For more information on HP's Certified and Supported ProLiant Servers for OS and Virtualization Software and the latest listing of software drivers available for your server and Smart Array RAID controller, please visit our Support Matrix at: [http://www.hp.com/go/ossupport](http://www.hp.com/go/ossupport)

**NOTE:** For more Linux OS support and certification information, please visit: [http://h18004.www1.hp.com/products/servers/linux/](http://h18004.www1.hp.com/products/servers/linux/)

**Software Suite**
Most current shipping Smart Array products share a common set of configuration, management and diagnostic tools, including HP Smart Storage Administrator and HP Systems Insight Manager. This software consistency of tools reduces the cost of training for each successive generation of product and takes much of the guesswork out of troubleshooting field problems. These tools lower the total cost of ownership by reducing training and technical expertise necessary to install and maintain HP server storage.

**HP Systems Insight Manager**
- Powerful server and server options/storage manager tool
- Monitors over 1200 system wide parameters
- Configuration/Diagnostic Utilities

**HP Smart Storage Administrator**
- Comprehensive management for HP Smart Storage products
- Simplified and intuitive interface and functionality
- Advanced scripting and diagnostic features

For more information please visit: [http://www.hp.com/go/hpssa](http://www.hp.com/go/hpssa)
**Service and Support**

**HP Technology Services**
Capitalizing on HP ProLiant server and HP BladeSystem capabilities require a service partner who understands your increasingly complex business technology environment. That’s why it makes sense to team up with the people who know HP infrastructure hardware and software best - the experienced professionals at HP Services.

**Protect your business beyond warranty with HP Care Pack Services**
When you buy HP Options, it’s also a good time to think about what level of service you may need. HP Care Pack services provide total care and support expertise with committed response choices designed to meet your IT and business need.

HP Foundation Care services offer scalable reactive support-packages for HP servers and software. You can choose the type and level of service that is most suitable for your IT and business needs. HP Proactive Care delivers high levels of system availability through proactive service management and advanced technical response.

**Recommended HP Care Pack Services for optimal satisfaction with your HP product**

**Optimized Care**

**3-Year HP 6 hour Call to Repair Response, Proactive Care**
Combined reactive and proactive support for hardware and software helping optimize your systems and delivering high levels of availability through proactive service management and advanced technical response. Hardware problem resolution to return the hardware in operating condition within 6 hours of the initial service request. A Technical Account Manager, as your single point of contact, will own your call or issue end to end until resolved.


**HP Installation of ProLiant Add On Options Service**
This easy-to-buy, easy-to-use HP Care Pack service helps ensure that your new HP hardware or software is installed smoothly, efficiently, and with minimal disruption of your IT and business operations.

**Standard Care**

**3-Year HP 24x7 4 hour response, Proactive Care Service**
This service gives you combined reactive and proactive support including rapid access to our Advanced Solution Center to manage and prevent problems and a Technical Support Specialist with a broad level of technical knowledge that will engage with additional technical expertise as needed from HP’s vast global resources.


**HP Installation of ProLiant Add On Options Service**
This easy-to-buy, easy-to-use HP Care Pack service helps ensure that your new HP hardware or software is installed smoothly, efficiently, and with minimal disruption of your IT and business operations.

**Related Services**

**HP Proactive Care Personalized Support - Environmental Option**
The Personalized Support option provides an assigned Account Support Manager who can bring best practices from across the industry plus extra technical skills to your IT team. This option is only available as an add-on to HP Proactive Care Support

**HP Proactive Select Service**
Provides a flexible way to purchase HP best-in-class consultancy and technical services. You can buy Proactive Select Service Credits when you purchase your hardware and then use the credits over the next 12 months.


**NOTE:** Additional HP Care Pack services can be found at: [http://hp.com/go/cpc](http://hp.com/go/cpc)
## Service and Support

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>HP Support Center</strong></td>
<td>Personalized online support portal with access to information, tools and experts to support HP business products. Submit support cases online, chat with HP experts, access support resources or collaborate with peers. Learn more <a href="http://www.hp.com/go/hpsc">http://www.hp.com/go/hpsc</a>. HP’s Support Center Mobile App* allows you to resolve issues yourself or quickly connect to an agent for live support. Now, you can get access to personalized IT support anywhere, anytime. HP Insight Remote Support and HP Support Center are available at no additional cost with a HP warranty, HP Care Pack or HP contractual support agreement.</td>
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<td><strong>Parts and materials</strong></td>
<td>HP will provide HP-supported replacement parts and materials necessary to maintain the covered hardware product in operating condition, including parts and materials for available and recommended engineering improvements. Parts and components that have reached their maximum supported lifetime and/or the maximum usage limitations as set forth in the manufacturer’s operating manual, product QuickSpecs, or the technical product data sheet will not be provided, repaired, or replaced as part of these services. The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by HP due to malfunction.</td>
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<td><strong>For more information</strong></td>
<td>To learn more on services for HP ProLiant Servers, please contact your HP sales representative or HP Authorized Channel Partner. Or visit: <a href="http://www.hp.com/services/proliant">http://www.hp.com/services/proliant</a>.</td>
</tr>
</tbody>
</table>

*HP’s Support Center Mobile App is subject to local availability*
NOTE: This is a list of supported options. Some may be discontinued.

**Hard Drives**

**SAS Hot Plug with SmartDrive SFF (2.5-inch) Enterprise Drives**
- HP 900GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive 652589-B21
- HP 600GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive 652583-B21
- HP 450GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive 652572-B21
- HP 300GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive 652564-B21
- HP 300GB 6G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive 652611-B21
- HP 146GB 6G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive 652605-B21

**SAS Hot Plug SmartDrive SFF (2.5-inch) Midline Drives**
- HP 1TB 6G SAS 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive 652749-B21
- HP 500GB 6G SAS 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive 652745-B21

**SAS Hot Plug SmartDrive LFF (3.5-inch) Midline Drives**
- HP 600GB 6G SAS 15K rpm LFF (3.5-inch) SC Enterprise 3yr Warranty Hard Drive 652620-B21
- HP 450GB 6G SAS 15K rpm LFF (3.5-inch) SC Enterprise 3yr Warranty Hard Drive 652615-B21
- HP 1TB 6G SAS 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive 695510-B21
- HP 3TB 6G SAS 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive 652766-B21
- HP 2TB 6G SAS 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive 652757-B21
- HP 1TB 6G SAS 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive 652753-B21

**SAS Hot Plug SmartDrive LFF (3.5-inch) Midline Drives**
- HP 4TB 6G SATA 7.2k rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive 693687-B21
- HP 3TB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive 628061-B21
- HP 2TB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive 658079-B21
- HP 1TB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive 657750-B21

**6G SATA Hard Drives**

**6G SATA Hot Plug with SmartDrive SFF (2.5-inch) Midline (MDL) Drives**
- HP 1TB 6G SATA 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive 655710-B21
- HP 500GB 6G SATA 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive 655708-B21

**6G SATA Hot Plug with SmartDrive LFF (3.5-inch) Midline (MDL) Drives**
- HP 4TB 6G SATA 7.2k rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive 693687-B21
- HP 3TB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive 628061-B21
- HP 2TB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive 658079-B21
- HP 1TB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive 657750-B21
- HP 500GB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive 658071-B21

**6G SATA Non-hot Plug LFF (3.5-inch) Midline (MDL) Drives**
- HP 3TB 6G SATA 7.2K rpm LFF (3.5-inch) Non-hot plug Midline 1yr Warranty Hard Drive 628065-B21
- HP 2TB 6G SATA 7.2K rpm LFF (3.5-inch) Non-hot plug Midline 1yr Warranty Hard Drive 659339-B21
- HP 1TB 6G SATA 7.2K rpm LFF (3.5-inch) Non-hot plug Midline 1yr Warranty Hard Drive 659337-B21
- HP 500GB 6G SATA 7.2K rpm LFF (3.5-inch) Non-hot plug Midline 1yr Warranty Hard Drive 659341-B21

**NOTE:** Please see the QuickSpecs for Technical Specifications and additional information:


(Worldwide)

**HP Solid State Drives (SSD)**

**12G SAS Enterprise Performance Solid State Drives**
- HP 800GB 12G SAS High Endurance SFF 2.5-in SC Enterprise Performance 3yr Wty Solid State Drive 741159-B21

**NOTE:** Please see the QuickSpecs for Technical Specifications and additional information:


(Worldwide)
## HP Smart Array P840 Controller

### Related Options

<table>
<thead>
<tr>
<th>12G SAS Enterprise Mainstream Solid State Drives</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP 800GB 12G SAS Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive</td>
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QuickSpecs

HP Smart Array P840 Controller

Related Options

Wty Solid State Drive
HP 200GB 6G SATA Mainstream Endurance LFF 3.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive 691854-B21
HP 100GB 6G SATA Mainstream Endurance LFF 3.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive 691852-B21

6G SAS ME Hot Plug SFF (2.5-inch) Enterprise Mainstream Solid State Drives
HP 800GB 6G SAS Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive 690829-B21
HP 400GB 6G SAS Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive 690827-B21
HP 200GB 6G SAS Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive 690825-B21

6G SAS SLC Hot Plug SFF (2.5-inch) Enterprise Performance Solid State Drives
HP 400GB 6G SAS SLC SFF (2.5-inch) SC Enterprise Performance 3yr Warranty Solid State Drive 653082-B21
HP 200GB 6G SAS SLC SFF (2.5-inch) SC Enterprise Performance 3yr Warranty Solid State Drive 653078-B21

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:

NOTE: Go to the HP Hard Drive Compatibility table for complete drive compatibility information (http://www.hp.com/products/harddiskdrives). Using hard drives in unsupported configurations will result in voiding the warranty and could result in damage to the drive and/or loss of data.

NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.

NOTE: Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.

HP Cable Options

Internal SAS Cables for P840

HP Smart Storage Battery
HP 96W Smart Storage Battery with 145mm Cable for DL/ML/SL Gen9 Servers 727258-B21
NOTE: Provides backup power for multiple HP Smart Array controllers or other supported devices (up to 16)

HP Secure Encryption
NOTE: HP Secure Encryption licensing is based on the number of physical drives requiring encryption.
HP Secure Encryption No Media E-LTU per Drive D8S85AAE
HP Secure Encryption No Media Flexible License per Drive D8S84A
NOTE: Electronic licenses are the recommended license delivery mechanism for HP Secure Encryption
NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
For more information visit: http://www.hp.com/go/hpsecureencryption

NOTE:

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**QuickSpecs**

**HP Smart Array P840 Controller**

**Technical Specifications**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dimensions</strong></td>
<td>6.6 in x 4.4 in x 0.6 in (16.8 cm x 11.1 cm x 1.5 cm)</td>
</tr>
<tr>
<td><strong>Disk Drive and Enclosure</strong></td>
<td></td>
</tr>
<tr>
<td>Interface - Transfer rate</td>
<td>12Gb/s SAS (Serial Attached SCSI)</td>
</tr>
<tr>
<td><strong>SAS Connectors</strong></td>
<td>2 internal x8 Mini-SAS double-wide connector</td>
</tr>
<tr>
<td><strong>SAS Port Link Rate</strong></td>
<td>12Gb/s per physical link</td>
</tr>
<tr>
<td><strong>PCI Link Rate</strong></td>
<td>PCIe3 x8</td>
</tr>
<tr>
<td><strong>Cache Memory Speed</strong></td>
<td>DDR3-1866MHz, 72-bit wide bus at 14.9GB/s (4 GiBytes cache module)</td>
</tr>
<tr>
<td><strong>Physical Drives Supported</strong></td>
<td>Up to 16 physical drives without expander</td>
</tr>
<tr>
<td><strong>Logical Drives Supported</strong></td>
<td>Up to 64 logical volumes</td>
</tr>
<tr>
<td><strong>Host Memory Addressing</strong></td>
<td>64-bit, supporting greater than 4GiB (or 4.4 GB) server memory space</td>
</tr>
<tr>
<td><strong>RAID Support</strong></td>
<td>RAID 6, 60 (Advanced Data Guarding)</td>
</tr>
<tr>
<td></td>
<td>RAID 5, 50 (Distributed Data Guarding)</td>
</tr>
<tr>
<td></td>
<td>RAID 1, 10 (Drive Mirroring)</td>
</tr>
<tr>
<td></td>
<td>RAID 1 ADM, 10 ADM (Advanced Data Mirroring)</td>
</tr>
<tr>
<td></td>
<td>RAID 0 (Striping)</td>
</tr>
<tr>
<td><strong>Upgradeable Firmware</strong></td>
<td>Upgradeable Firmware with recovery ROM feature</td>
</tr>
<tr>
<td><strong>Environment-friendly</strong></td>
<td>Hewlett-Packard offers end-of-life HP product return, trade-in, and</td>
</tr>
<tr>
<td>Products and Approach</td>
<td>recycling programs in many geographic areas. For trade-in information,</td>
</tr>
<tr>
<td><strong>End-of-life Management</strong></td>
<td>please go to: <a href="http://www.hp.com/go/green">http://www.hp.com/go/green</a>. To recycle your product, please</td>
</tr>
<tr>
<td><strong>and Recycling</strong></td>
<td>go to: <a href="http://www.hp.com/go/green">http://www.hp.com/go/green</a> or contact your nearest HP sales</td>
</tr>
<tr>
<td></td>
<td>office. Products returned to HP will be recycled, recovered or disposed of</td>
</tr>
<tr>
<td></td>
<td>in a responsible manner.</td>
</tr>
</tbody>
</table>

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/green. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.
Summary of Changes

<table>
<thead>
<tr>
<th>Date</th>
<th>Version History</th>
<th>Action</th>
<th>Description of Change:</th>
</tr>
</thead>
<tbody>
<tr>
<td>01-Dec-2014</td>
<td>From Version 1 to 2</td>
<td>Added</td>
<td>Added note to endorse the HP Smart Array P840/4GB FBWC controller option kit does not include the HP Smart Storage Battery.</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>HP Cable Options and HP Smart Storage Battery were added to Related Options section.</td>
</tr>
</tbody>
</table>