

Adaptec Flash Module Zero-Maintenance Cache Protection Kit (AFM 600)

Maximum Data Protection and Cost Savings for Adaptec Series 6 Series 6Q and Series 6T RAID Controllers



Enabling the onboard cache on a RAID controller card significantly enhances performance — especially in RAID 5 and RAID 6 scenarios — by accommodating both read caching and write caching of data. But data stored in the cache for write caching can be lost if the cache is not protected against a power or system failure.

Lithium-ion battery backup units (BBUs) are traditionally employed to protect cached data on RAID controllers, but they are not an optimal solution. BBUs have hidden costs that can drastically increase a RAID controller's Total Cost of Ownership (TCO) by thousands of dollars per year, including monitoring and maintenance expenses. Over time, all batteries lose their ability to hold a charge, so BBUs need to be periodically replaced and the old units must be disposed of in an environmentally-responsible manner.

Once installed, a new BBU will take several hours to reach a full charge, leaving the write cache turned off and affecting performance. To make matters worse, even a typical BBU needs to test capacity regularly and performs suboptimal during those test periods. Additionally a fully-charged BBU can only preserve data for a maximum of 72 hours during a power loss before the battery power depletes.

Zero-Maintenance Cache Protection

Now in its second generation, Adaptec Zero-Maintenance Cache Protection (ZMCP) drastically reduces a controller's TCO by using flash memory instead of BBUs to provide full protection of cached data without the

monitoring, maintenance, replacement, and disposal requirements and costs associated with Lithium-ion batteries.

Adaptec Flash Module 600

ZMCP is available for Adaptec Series 6 and 6T controllers as an optional Adaptec Flash Module (AFM 600) and is preinstalled on all Series 6Q models supporting Adaptec maxCache SSD caching feature. The modular aspect of the AFM 600 gives data centers the flexibility of adding ZMCP at any time, or not adding it at all, depending on budgets and requirements. Competitive alternatives are built into the controller cards — forcing data centers to purchase a new card in order to add cache protection.

The AFM 600 features 4GB of NAND flash memory and super capacitor technology that work together to save cached data in the event of system power loss. The super capacitor charges while the system is booting to provide instant cache protection upon startup. When the module detects loss of power, the super capacitor keeps critical parts of the controller active long enough to allow data to be copied from the onboard controller cache to the flash memory.

Once the data has been copied, the flash memory can store it for years without power, allowing for less urgency in disaster recovery plans than the 72-hour BBU threshold. When power is returned to the controller, the data in the flash memory is copied back to the onboard controller cache and operation resumes as normal with all outstanding I/O requests intact.

Product Highlights

Cached Data Protection for 6Gb/s Ecosystem

- Add-on module for Adaptec Series 6 and 6T RAID controllers
- Included with Series 6Q RAID controllers

Single-Level Cell (SLC) Flash

- Faster writes and better reliability than Multi-Level Cell (MLC) Flash

Low Operating Costs

- No monitoring, maintenance, replacement or disposal costs due to batteries
- More than 40% cost savings over a four-year period vs. BBUs

No Data Loss from Power Failures

- Replaces Lithium-ion batteries

Maintenance-Free Cached Data Protection

- No need to monitor battery charge level
- No shutdown required for battery replacement
- Stores protected data for years

Instant RAID Cache Protection

- Charges in minutes instead of hours
- RAID performance optimized immediately

Environmentally Conscious

- No toxic battery disposal
- Simplified IATA compliance



BBUs vs. ZMCP: Maintenance Requirements

Lithium-ion BBUs	Adaptec by PMC ZMCP
Batteries must be "conditioned" during initial deployment, adding custom steps and several hours to the deployment process	No action required
Battery performance must be continually monitored so that failing batteries can be replaced	No action required
A failed battery must be replaced within 72 hours, and sometimes less	No action required
Batteries must be replaced on a regular maintenance cycle, so replacement batteries must be kept available at each location and maintenance staff must be on-site or on-call	No action required
Replacement batteries "age" even when on the shelf, so a continual purchasing process must be developed and implemented	No action required
Lithium-ion batteries must be properly disposed. A process to dispose of the hazardous material must be created, staffed, and funded	No action required

BBUs vs. Series 6 with ZMCP Cost Comparison

Parameter	Typical RAID controller with Lithium-ion BBU	Adaptec RAID 6805
Adapter Price	\$ 595 SRP	\$ 550 SRP
Cost for Cache Protection	\$ 175 (BBU)	\$ 195 SRP
Replacement BBU	\$ 175	\$ 0
Serviceability	\$ 265	\$ 0
Disposal - Hazmat	\$ 25	\$ 0
Total 4 year cost	\$ 1235	\$ 745 SRP

In typical real-world scenarios, ZMCP offers cost savings of more than 40% over a four-year period.

Adaptec Flash Module 600 (AFM 600)

Why to buy	The Adaptec Flash Module 600 (AFM 600) provides Zero-Maintenance Cache Protection (ZMCP) for Adaptec Series 6, Series 6T and Series 6Q RAID controllers to protect data in the controller cache without incurring monitoring, maintenance, replacement, or disposal costs.
Customer Needs	Solutions that require advanced protection of data and reduced Total Cost of Ownership (TCO).
Compatible Products	<ul style="list-style-type: none"> Adaptec RAID 6405 Adaptec RAID 6445 Adaptec RAID 6805 Adaptec RAID 6405T Adaptec RAID 6805T Adaptec RAID 6805Q (included) Adaptec RAID 6805TQ (included)
Operating Temperature	0°C to 50°C (with 200 LFM airflow)
Operating Voltage	0.17A @ 3.3V; 1.25A @ 12V measured on PCIe Gen2 systems with a Series 6 controller and 6G drives
Regulatory Certification	CE, FCC, UL, C-tick, VCCI, KCC
Environmental Compliance	RoHS, REACH
Typical Lifespan	7 years at 40°C
Warranty	3 years
Part Number	2269700-R



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