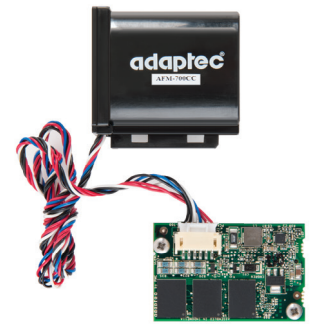# adaptec
by PMC

3rd Gen Zero-Maintenance Cache Protection Adaptec Flash Module 700 Kit (AFM-700)

Maximum Data Protection and Cost Savings for Adaptec Series 7 and Series 7Q RAID Adapters

Enabling the onboard cache on a RAID adapter 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 (Li-ion) battery backup units (BBUs) are traditionally employed to protect cached data on RAID adapters. Once installed, a new BBU will take several hours to reach a full charge. During the charge cycle, write cache is unprotected (i.e. turned off), which adversely affects the RAID adapter's performance. A typical BBU requires routine capacity testing and performs sub-optimally during those test periods. Lastly, a fully-charged BBU can only preserve data for a maximum of 72 hours during a power loss before the battery power depletes.

Li-ion BBUs have hidden costs that can drastically increase a RAID adapter's Total Cost of Ownership (TCO) by hundreds of dollars per year through monitoring, maintenance, replacement, and disposal expenses

Zero-Maintenance Cache Protection

Now in its third generation, Adaptec Zero-Maintenance Cache Protection (ZMCP) drastically reduces a RAID adapter's TCO through the use of flash memory versus Li-ion batteris. These flash modules provide full protection of cached data without the costs associated with Li-ion batteries.

Adaptec Flash Module 700

ZMCP is available for Adaptec Series 7 adapters (72405, 71685, 71605, 7805) as an optional Adaptec Flash Module (AFM-700)

and is preinstalled on all Series 7Q models supporting Adaptec's maxCache 3.0 SSD caching feature. The modular aspect of the AFM-700 gives data centers the flexibility of adding ZMCP at any time, depending on their needs and budgetary parameters. Competitive alternatives force data centers to purchase a new card in order to add cache protection, as certain functionality is built into their base adapter.

The AFM-700 features 2GB 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 RAID adapter active long enough to allow data to be copied from the onboard adapter cache to the flash memory.

Once the data has been copied, the flash memory can store it for years without power. When power is returned to the RAID adapter, the data in the flash memory is copied back to the onboard adapter cache and operation resumes as normal with all outstanding I/O requests intact.

Lastly, with its new monitoring features (Real-time Health and Instant Capacity Monitoring), data center administrators can instantly check the temperature, capacity and remaining lifetime of the super capacitor through Adaptec maxView Storage Manager, a web-based interface that makes it simple to view, monitor, and configure all Adaptec RAID adapters in a system, without disrupting operations or impacting performance.

Product Highlights

Third Generation Cached Data Protection for 6Gb/s Ecosystem
- Add-on module for Adaptec Series 7 RAID adapters
- Included with Series 7Q RAID adapters

Real Time Health Monitoring
- Monitors health of cache protection
- Monitors capacity levels

Instant RAID Cache Protection
- Charges in minutes instead of hours
- RAID performance optimized immediately

Maintenance-Free Cached Data Protection
- Stores protected data for years
- No need to monitor battery charge level
- No shutdown required for battery replacement

Lower Operating Costs
- No monitoring, maintenance, replacement or disposal costs due to batteries

No Data Loss from Power Failures
- Replaces Lithium-ion batteries

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

Environmentally Conscious
- No toxic battery disposal
- Simplified IATA compliance

ZMCP
ZERO-MAINTENANCE
Cache Protection

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

Adaptec Flash Module 700 (AFM-700)

Why to buy	The Adaptec Flash Module 700 (AFM-700) provides Zero-Maintenance Cache Protection (ZMCP) for Adaptec Series 7 and Series 7Q RAID adapters 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	• Adaptec RAID 72405 • Adaptec RAID 71685 • Adaptec RAID 71605 • Adaptec RAID 7805 • Adaptec RAID 71605Q (included) • Adaptec RAID 7805Q (included)
Operating Temperature	0°C to 50°C (with 200 LFM airflow)
Operating Current	ASR-7805/7805Q: 0.1A@3.3V and 1.5A@12V ASR-71605/71605Q: 0.1A@3.3V and 1.6A@12V ASR-71605E: 0.1A@3.3V and 1.5A@12V ASR-71685/72405: 0.1A@3.3V and 1.8A@12V measured on PCIe Gen3 systems with 6G drives
Regulatory Certification	CE, FCC, UL, C-tick, VCCI, KCC
Environmental Compliance	RoHS
Typical Lifespan	5 years at 50°C
Warranty	3 years
Part Number	2275400-R

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