

Modern video recording systems are in the main either tape, hard drive or optical based. There is however a new player in this field which is set to revolutionize video recording systems –Flash memory

Flash memory is a non-volatile solid state semiconductor memory system that has no moving parts (such as video tapes), is not magnetic (hard disk) or optical (CD).

### **Benefits of Flash based recording systems**

#### *Reliability and Ruggedness*

Hard disk failure is a common occurrence with horror stories abounding about valuable data lost and the agony of trying to retrieve or at least save a portion of the crashed hard drive. It is during this time that people ask: why do hard disks fail?

The reason is simple - wear and tear. Just like any machine with mechanical components, hard disk drives (HDD) tend to deteriorate over time. HDD's consist of rotating, magnetically coated disks, known as platters that are used to store data. The rotating motion of the platter and mechanical arms results in considerable wear and tear after long periods of use. Furthermore, a hard drive, like video tapes and optical systems, are particularly vulnerable when used in rugged on the go environments such as motorcycle touring.

In terms of reliability, conventional HDD's, tapes and optical recording systems pale when compared to Flash. The absence of mechanical arms, spinning platters, recording heads and tape mechanisms is the reason behind Flash's reliability.

In demanding environments Flash memory can withstand extreme shock and vibration without any danger of data loss. Their ability to deliver unnerving performance in extreme conditions makes Flash particularly useful in many applications including military operations, aerospace, aviation, industrial and motorcycle touring.

Shock, vibration, and temperature ratings of non Flash systems simply cannot compete with Flash memory.

#### *Longevity*

An average Flash memory chip has around 600,000 write cycles however with advances in technology Flash chips rated at 1,500,000 write cycles per block are becoming common and affordable.

Flash memory manufacturers employ different ways to increase the longevity of the drives. In some cases, they use a "balancing" algorithm to monitor the number of times each disk block has been written, which greatly extends the operational lifespan of the drive. Furthermore, these manufacturers have also designed special "wear-leveling" algorithms where once a certain percentage threshold for a given block is reached, the

memory will swap the data in that block with the data in another block that has exhibited a "read-only-like" characteristic in the background. This reduces performance lag and avoids further wearing off of the blocks. Even with usage patterns of writing/reading gigabytes per day, a Flash-based memory will last many years.

### ***Speed***

Flash memory access time does not depend on a read/write interface head synchronizing with a data sector on a rotating hard disk. Neither is it reliant on a recording head found in tape and optical based systems.

Flash-based memory is approximately 100 times faster than a rotating disk. The typical access time for a Flash based memory is about 35 - 100 micro-seconds, whereas that of a rotating hard disk is around 5,000 - 10,000 micro-seconds.

### ***Power and Heat Dissipation***

Flash based memory consumes much less power than traditional HDD's ,tape and optical systems e.g. no additional power is required to activate the platters or the mechanical arms present in most HDD's making Flash's power consumption a fraction of a hard disk drive. The benefit of this is self evident, longer running times between recharging is particularly useful when on the road.

Finally there is also less heat dissipation for Flash systems. This is due to the absence of heat generated from the rotating/movable media. Less heat dissipation extrapolates to increased reliability and integrity of data making it the ideal data storage solution for mobile systems



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