



30GB OF PERMANENT WRITE ONCE AND REWRITABLE DATA STORAGE

First generation 30GB, double-sided UDO™ optical media is available in both Rewritable and true Write Once formats. Using patented Phase Change recording technology, data is written and read from the media with a blue-violet laser focused through high numerical aperture optics.

PHASE CHANGE RECORDING

Phase Change technology is based on a specially designed recording layer that can exist in both amorphous and crystalline states and is transformed between these two states by the heat from a precision laser. UDO's blue-violet laser is focused through a 0.7 NA lens, which generates a very small spot on the recording layer, transforming the state of the media and creating a data mark. The same laser operating under a lower power reads these data marks. Phase Change recording is a totally non-magnetic process, providing very stable data storage that is completely impervious to damage from magnetic field exposure and bit drift.

UDO MEDIA CONSTRUCTION

UDO Write Once and Rewritable media use the same basic media format, but have different Phase Change alloy coatings optimised for their specific applications. UDO Write once media uses a patented Phase Change system that records irreversible crystalline state data marks. UDO is a true Write Once media since the data marks cannot be altered or modified once written and offers excellent environmental stability. UDO Rewritable is a fast recording media with high cyclability and resistance to cross erase. These characteristics allow the laser to reverse the amorphous and crystalline states of the recording layer, creating a robust disk that supports more than 10,000 direct overwrite cycles.

The recording layer of UDO media is protected by a 100µm, hard-coated cover layer. Under normal operation media cleaning is not needed, but the hard-coat layer accommodates cleaning if required in harsh environments.

UDO MEDIA MANUFACTURING

UDO media is manufactured in a carefully controlled ISO 9001 certified clean room environment. The fully automated manufacturing process produces high quality, professional grade media with a 50+ year media life. To facilitate regulatory audit trails, each piece of media is manufactured with a unique serial number and can also be labelled with bar codes for automated audit trail and media tracking.

CARTRIDGE DESIGN

In order to protect UDO disks from physical damage and contamination, the double-sided media is enclosed in a rugged ISO standard 5.25 inch form factor cartridge that is ECMA Drop Test certified. UDO cartridges are manufactured with a specially developed anti-static polycarbonate and have a unique double-shutter design to protect from external and internal particle contamination. Only the bottom half of the UDO double-shutter is opened when media is loaded into the drive thus preventing dust accumulation on the top service of the media. Extensive Particle Chamber testing documents a more than 20x reduction in media contamination using the double-shutter when compared to single-shutter MO cartridges. Lower dust contamination means more reliable read/write operations and extended media life.

THE FUTURE OF UDO MEDIA

Future UDO drives will support 60GB and 120GB UDO media while providing backward compatibility with earlier generations, minimising technology disruption, maintaining data access continuity and protecting initial capital investments.



Media Specifications	Write Once / Rewritable
Disk Diameter	130mm
Disk Thickness	2.4mm
Cartridge Size	5.25 inch - ISO Standard 135 x 153 x 11mm
Capacity	30GB
Sector Size	8KB
Number of User Sectors / Side	1,838,6521
Data Area	27.0 - 62.5mm
Recording Layer	Phase change
Recording Format	Land and groove
Recording Side	Both sides
Recording Density	7.4 Gb/in ²
Media Layers	1
Data Encoding	RLL (1,7)
Rewrite Cycles (Rewritable Media)	10,000
Media Life	50+ years

¹Subject to future change

UDO DRIVES

ROBUST AND HIGH PERFORMANCE

The UDO drive is a high performance multifunction 5.25 inch, half-height form factor optical disk drive. The first generation drives use a blue-violet optical laser assembly to read and write data to 30GB Write Once and Rewritable UDO media. Designed specifically to meet the rigorous demands of automated library environments, UDO drives have a documented MSBF of 750,000 load/unload cycles.

UDO DRIVE OPERATION

UDO drives operate with a 8KB sector size with direct overwrite capability. When writing data to Rewritable and Write Once media, the UDO drive uses only two passes: write and verify. This two pass capability increases write performance by 50% when compared to previous generation MO drives that require three passes and must first erase/blank check the media before writing and verifying.

UDO drives read/write data to the media while spinning at a Constant Angular Velocity (CAV). The drive is capable of managing different data rates as the optical head moves from outside tracks (higher speed) to inside tracks (lower speed). By comparison, DVD drives change the media speed as the laser head moves across the disk in order to read/write data at a constant rate; known as Constant Linear Velocity (CLV). CAV provides much faster seek times than CLV since there's no need to constantly adjust drive spindle speed while accessing different locations on the disk.

UDO DRIVE CONTAMINATION REDUCTION

The UDO drive is cooled by pulling air across heat generating components such as the laser assembly and the PC board. In order to avoid unnecessary particle contamination, a special dust barrier has been developed to completely isolate the media area from the cooling airflow. This design dramatically reduces dust exposure to media loaded in the drive.

UDO DRIVE ERROR CORRECTION

UDO drives make use of enhanced Reed-Solomon Error Correction Code (ECC) and Erasure Correction algorithms to ensure that data can be accurately read from the media despite physical defects or contamination. The combination of these two techniques provides a 4x improvement in ECC handling over MO drives. UDO drives have also implemented an optimised read-ahead defect handling methodology that provides much greater performance when managing secondary media defects.

UDO LIBRARY CONFIGURATIONS

UDO drives and media use the same physical form factors as previous generation MO technology and the drive interfaces with a standard SCSI command set. This greatly

simplifies the adoption of UDO technology by software vendors and its integration into automated optical libraries including mixed media configurations.

While media and drive form factors remain the same, UDO drives cannot read/write MO media and vice-versa. To prevent media cross loading, UDO drives have mechanical features that identify and reject MO media. UDO cartridges were deliberately designed with a slightly different shutter alignment than MO media so that MO drives will also reject UDO media.

THE FUTURE OF UDO DRIVES

Future UDO drives will support 60GB and 120GB UDO media while providing backward compatibility with lower capacity media, minimising technology disruption, maintaining data access continuity and protecting initial capital investments.

Drive Specifications	
Performance	
Media Load Time	5 sec
Media Unload Time	3 sec
Average Seek Time	25 msec
Max Sustained Read Transfer Rate	8 MB/s
Max Sustained Write Transfer Rate	4 MB/s (including verification)
Disk Rotation Speed	2160 rpm +/- 0.5%
Drive Buffer Size	32MB
Drive Operation	
Error Correction	Reed-Solomon
Objective Lens Numerical Aperture	0.7 NA
Laser Wavelength	405nm
Operating Conditions	
Operating Temperature	5 to 45 °C
Operating Humidity	5 to 90% RH (non condensing)
Read Power Consumption	12W
Drive Orientation	Horizontal or Vertical
Reliability	
MSBF	750,000 load/unload cycles
MTBF	100,000 hours
Dimensions and Weight	
Drive Interface	H 41.1 x W 146 x D 203 mm
Drive Weight	1.5kg
Drive Interface	
Interface	Wide Ultra 2 LVD SCSI
SCSI Connector Type	Keyed 68 pin micro-D
Maximum SCSI Transfer Rate	80 MB/s
Certifications	
Emissions	CISPR 22 Class B (1985) EN55022 Class B (1988) FCC 47 CFR Part 15 Class B
Safety	UL 1950 IEC950, IEC825-1 CSA 950-93 21CRF



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