

Wren™ III 5¼-inch Rigid Disk Drive

Designed for Original Equipment Manufacturers (OEM)



NOV 24 1985

The Control Data Wren III disk drive is a 5¼-inch Winchester drive that offers a choice of 101, 141 and 182 megabytes of unformatted storage capacity.

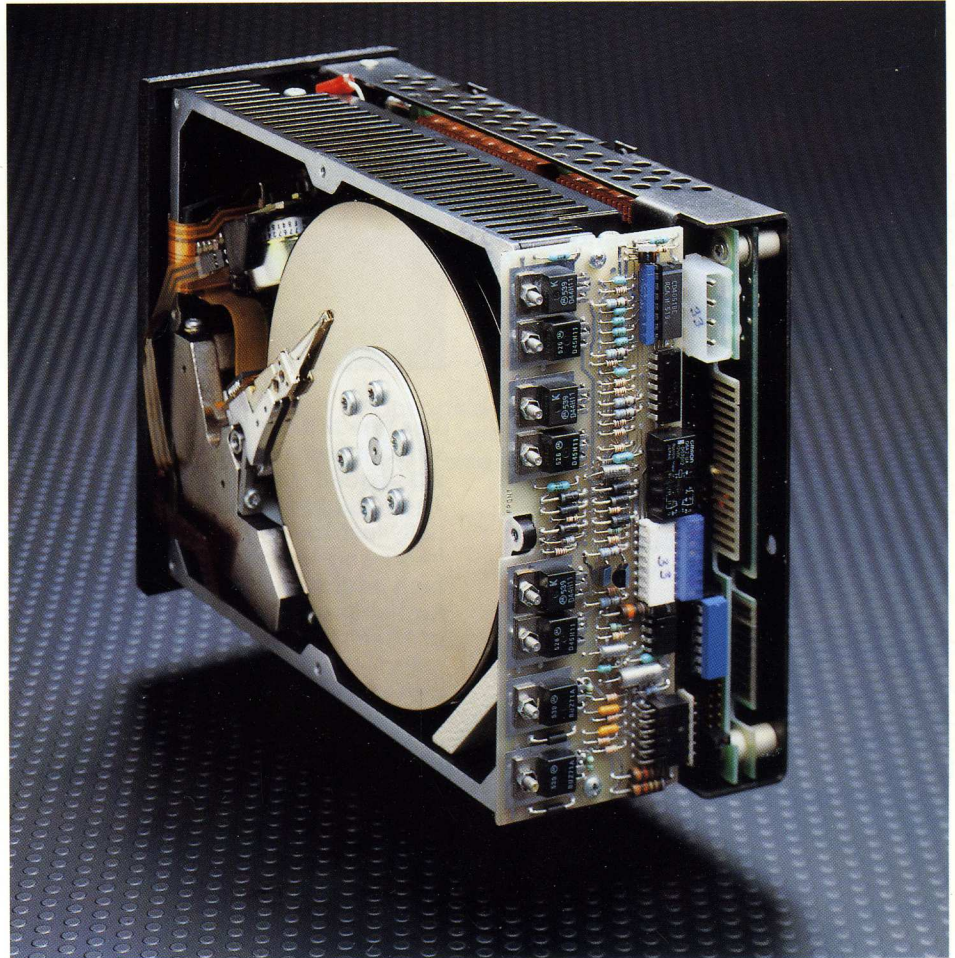
The Wren III builds on the technologies proven in earlier models of the Wren family. In addition to increased capacity, the Wren III drives provide improved performance and increased reliability.

The Wren III uses the Enhanced Small Disk Interface (ESDI) proven in Wren II drives, but with a 1.25 megabytes/second transfer rate—twice as fast. A new straight arm actuator design (patent pending) reduces actuator mass. The low mass actuator uses new high efficiency magnets and achieves an 18-millisecond average seek.

Mean Time Between Failure has been increased to 20,000 hours through extensive use of VLSI electronics, which reduces power consumption and heat buildup.

Features

- 101, 141 or 182-Mbyte capacities
- 18-millisecond average seek
- 20,000-hour MTBF
- ESDI or SCSI interface
- Fully sealed, ultra-clean, head/disk/actuator chamber
- Balanced rotary voice coil actuator
- Closed-loop, dedicated servo system
- Dedicated head-landing zone
- Automatic actuator restraint/shipping lock
- Shock-mounted HDA
- Vertical or horizontal mounting
- Low noise level

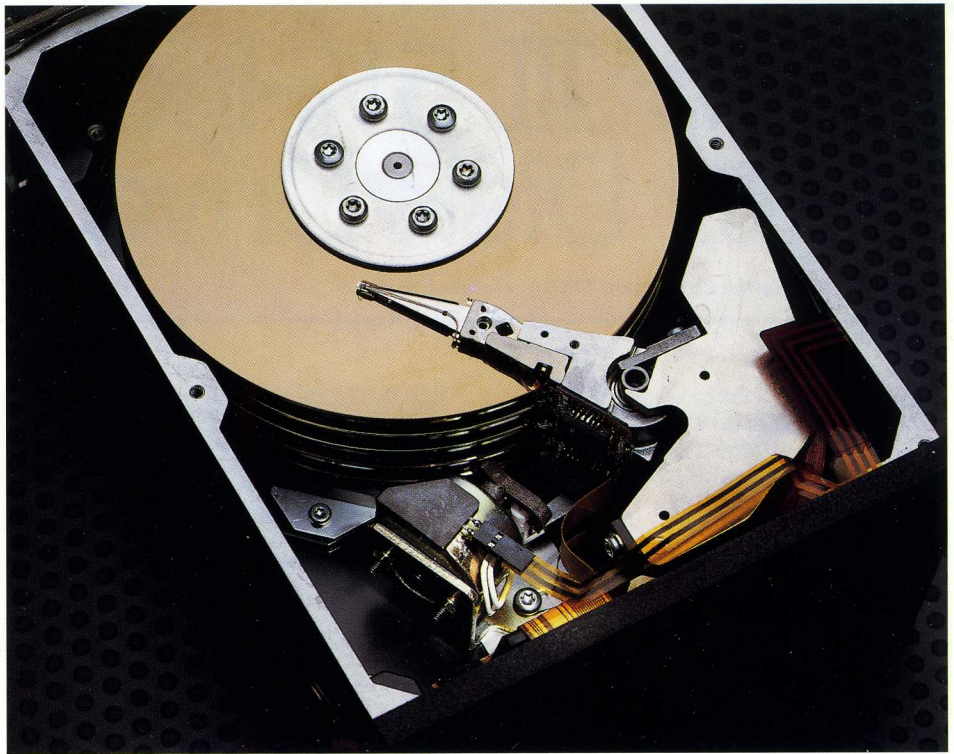


Interfaces

The Wren III drive is available with two interfaces:

- ESDI — The high-performance ESDI interface provides a 1.25 megabyte per second transfer rate. It is a drive level interface that incorporates data recovery and separation in the drive. ESDI supports either step or serial modes and the three following sector modes: address marks, sector pulses or byte clock.





- SCSI** — A system level interface that provides complete compatibility with the ANSI definition. The SCSI electronics are embedded in the drive, eliminating the need for external controllers and cables.

The SCSI controller has an 8-kilobyte buffer for increased performance. The controller manages data integrity through automatic flaw sector reallocation and automatic error recovery, improving throughput.

Heads and Disks

The Wren III drive contains three to five thin-film disks in an environmentally sealed chamber. No unfiltered outside air is drawn into the unit. Air is recirculated within the disk/actuator chamber and passes through a filter to ensure a contamination-free environment.

Positioning System

A new positioning system (patent pending) provides precise placement of the read/write heads over the data. The result is high performance combined with unexcelled data integrity.

The heads are mounted on a new straight-line arm that is connected to a balanced rotary voice coil actuator. The straight-line design has substantially less mass than other designs, improving accuracy and speed. New high energy magnets in the voice coil further improve performance, resulting in 18-millisecond average seek. A microcomputer controlled, dedicated, closed-loop servo system provides precise positioning control.

In another performance improvement, the servo control moves the actuator with the first seek pulse received, increasing throughput.

An automatic actuator lock and emergency head retract system automatically move the heads to the landing zone when power is removed. The landing zone contains no data, thus there is no data degradation from heads landing.

The Wren Family

The Control Data Wren Winchester disk drive family provides a range of models that store from 21 to 182 megabytes:

- Wren I: 21 to 36 Mbytes
- Wren II: 48 to 86 Mbytes
- Wren II Half-Height: 51 Mbytes
- Wren III: 101 to 182 Mbytes

Applications

The Wren III is designed for applications where capacity and performance are important. These applications frequently are in multi-user, multi-tasking systems and local area networks with file server requirements.

- Small business systems
- Office automation systems
- Word processing
- Local area networks
- Multi-user microcomputers
- Low-end minicomputers
- Engineering workstations
- CAD/CAM systems

Options and Accessories

- Front panel (standard or thin)
- Power supply (60 or 50 Hz)
- Single-unit shipping pack

Maintenance and Spares

All Control Data products are backed by comprehensive maintenance and spare parts support programs.

SPECIFICATIONS

Capacity	101 Mbytes	141 Mbytes	182 Mbytes
Configuration			
Number of disks	3	4	5
Data surfaces	5	7	9
Servo surfaces	1	1	1
Tracks per surface	969		
Track density	960 TPI		
Recording density	19,058 BPI		
Recording method	2.7		
Performance			
Rotation speed	3600 r/min		
Average latency	8.33 ms		
Seek time	<i>Typical</i>		<i>Worst case</i>
Single track	4 ms		5 ms
Average	16.4 ms		18 ms
Maximum	40 ms		43 ms
<p>Worst case averages are derived by dividing the sum of the times for all possible seeks by the total number of seeks for all temperature and voltage tolerances.</p> <p>Typical access times are derived from observed values under normal operating conditions.</p>			
Interface			
Type	ESDI		SCSI
Transfer rate			
Sustained	10 Mbits/s		Supports a one-to-one interleave for a 10-Mbit/sec internal disk data rate
Burst	NA		1.25 Mbyte/sec
Data code	NRZ		NRZ
Reliability and Maintainability			
Error rate			
Recoverable	1 in 10 ¹⁰ bits read, max		
Unrecoverable	1 in 10 ¹² bits read, max		
Seek	1 in 10 ⁶ seeks, max		
MTBF	Greater than 20,000 hours		
MTTR	1/2 hour		
Preventive maintenance	None		
Service life	7 years or 30,000 hours		
Power Requirements			
AC	Not required		
DC	+12 V (+5%), 1.6 A (Typical operating)		
	+5 V (+5%), .7 A (Typical operating)		
Power dissipation	23 W (75.2 Btu) typical		
Environmental			
Temperature			
Operating	10 to 50°C (50 to 122°F)		
Storage	-10 to 54°C (14 to 130°F)		
Transit	-40 to 70°C (40 to 158°F)		
Relative humidity			
Operating	5 to 85%		
Storage	5 to 95%		
Transit	5 to 95%		
Altitude			
Operating	-305 to 3,048m (-1,000 to 10,000 ft)		
Transit	-305 to 12,210m (-1,000 to 40,000 ft)		
Physical			
Height	82.55mm (3.25 in)		
Width	147mm (5.75 in)		
Depth	203mm (8 in)		
Weight	3.3 kg (7.2 lb)		

Specifications subject to change
without notice.

Control Data sales offices are located in
principal cities throughout the world.

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