

Wren™ III 5¼-inch Rigid Disk Drive



Designed for Original Equipment Manufacturers (OEM)

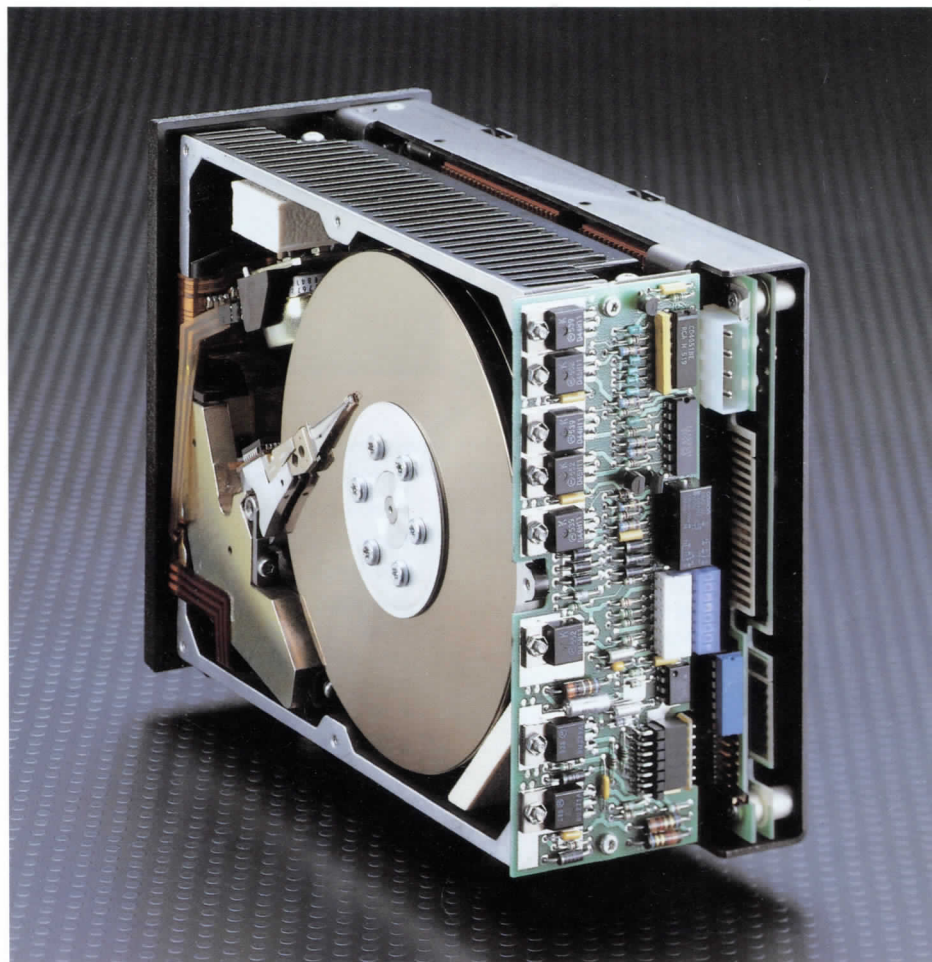
The Control Data Wren III disk drive is a full-height, 5¼-inch Winchester that offers a choice of two industry standard interfaces—ESDI and SCSI.

Available in capacities from 101 to 182 megabytes (unformatted), the Wren III builds upon the technologies proven in earlier models of the Wren family. In addition to increased capacity, the Wren III provides improved performance and reliability. Average seek time for the Wren III is 16.5 ms including head settle. The 40,000-hour MTBF is based upon field-reported data from the installed base of Wren family products.

The extensive use of VLSI circuitry and surface mounted components reduces power consumption to 21 watts. Such low power consumption results in cool operation, which contributes to the 40,000-hour MTBF and to low operating cost. No external cooling is required.

Features

- ☐ 16.5 ms average seek (including head settle)
- ☐ 40,000-hour MTBF
- ☐ Multiple capacity configuration
- ☐ Choice of ESDI or SCSI interface
- ☐ Patented, balanced low mass, straight arm rotary voice coil actuator
- ☐ Closed-loop dedicated servo
- ☐ Read/write heads automatically retract to dedicated head landing zone outside data area
- ☐ Automatic actuator restraint/shipping lock
- ☐ Low power consumption
- ☐ Low audible noise
- ☐ Sealed HDA with lifetime internal air filtration and humidity control
- ☐ Integral HDA isolation mounts
- ☐ Choice of mounting positions
- ☐ Dynamic spindle braking
- ☐ No preventive maintenance required
- ☐ No mechanical or electrical adjustments
- ☐ Epoxy coated base casting



**You Cannot
Outdistance
Control Data**



ESDI Interface

The high-performance ESDI interface provides 1.25 megabytes per second transfer rate. It is a drive level interface that incorporates data recovery and separation in the drive. The NRZ format simplifies controller design and provides increased data integrity.

The Wren III ESDI supports serial modes and the following sector modes

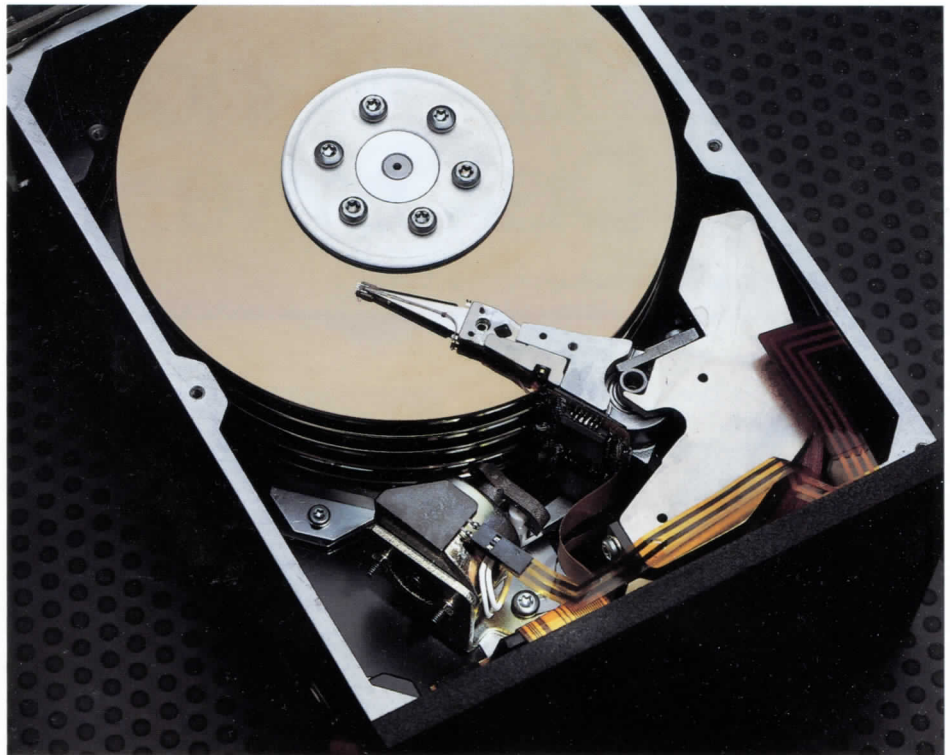
- ☐ Address marks (soft sector)
- ☐ Sector pulse (hard sector)

SCSI Interface

The Wren III with an embedded SCSI controller provides conformance with the ANSI SCSI Standard and Common Command Set. The SCSI interface supports multiple initiators, disconnect/reconnect, self configuring host software, and automatic features that relieve the host from the necessity of dealing with the physical characteristics of the targets. Logical block addressing is used.

SCSI Features

- ☐ Variable byte sector size in one-sector increments from 256 to 2048 bytes per sector. Other byte sector sizes
- ☐ Single-ended, open-collector transmitters
- ☐ Single-ended hysteresis-gate or equivalent receivers
- ☐ Transfer rate
 - Asynchronous burst = 1.25 Mbytes/sec
 - Sustained = 1.07 Mbytes/sec
- ☐ 2 ms or less controller overhead
- ☐ 8 kilobyte data buffer standard 32 kilobyte optional
- ☐ 32-bit ECC (48-bit July 1987)



- ☐ ECC capable of correcting 1 burst per sector up to 8 bits (11 bits with 48-bit ECC)
- ☐ Flaw management—spare sector per track
- ☐ Diagnostic functionality—Status checks of microprocessor, ROM and RAM; read/write on dedicated cylinders; automatic adjustment of seek profile
- ☐ 8 ms cylinder skew

Fast Throughput

The average access time of 18.5 ms coupled with a 32 kilobyte data buffer and 8 ms cylinder skew combine to provide the fast data throughput needed in today's performance systems.

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. Lifetime desiccant provides humidity control internal to the HDA.

Positioning System

The patented straight arm positioning system 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 patented 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 16.5-millisecond average seek. A microcomputer controlled, dedicated, closed-loop servo system provides precise positioning control.

Automatic Actuator Lock

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.

Epoxy Coated Base Casting

The base casting is coated with epoxy. This coating helps keep the head/disk area clean during manufacturing and eliminates contamination due to corrosion.

Options and Accessories

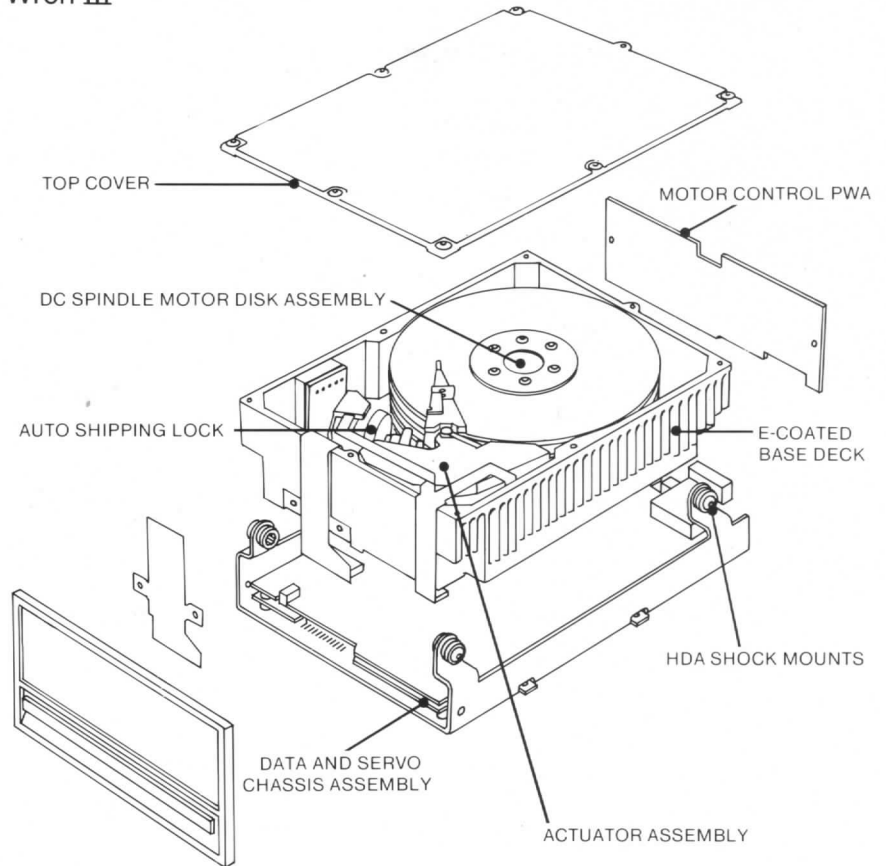
- ☐ Front panel (standard or thin)
- ☐ Power supply (60 or 50 Hz)
- ☐ Single or multiple unit shipping pack
- ☐ 32 kilobyte data buffer (SCSI only)

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

Wren III



Product Safety Standards

All Wren family products meet minimum requirements for: UL, CSA, and VDE certification.

Wren family products are supplied as Class A computing devices per FCC rules governing electromagnetic interference.

Maintenance and Spares

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

Repair

Control Data provides dedicated repair facilities for all Wren family products.

The Wren Family

The Control Data Wren Winchester disk drive family provides a range of models that store from 48 to 300 MB.

- ☐ Wren II: 48 to 86 MB
 - ST506
 - ESDI
- ☐ Wren II HH: 51 MB
 - ST506
- ☐ Wren III: 101 to 182 MB
 - ESDI
 - SCSI
- ☐ Wren III HH: 106 MB
 - ESDI
 - SCSI
- ☐ Wren IV: 300 MB
 - SCSI

SPECIFICATIONS

Capacity *(Mbytes)

ESDI — Unformatted	101	141	182
SCSI — Formatted 512 Bytes/Sector	86	121	155
Formatted 1024 Bytes/Sector	89	124	160

*Does not include spare sectors

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 RLL		

Performance

Rotation speed	3600 rpm		
Average latency	8.33 ms		
Seek time	Typical	Worst case*	
Single track	4 ms	5 ms	
Average	16.5 ms	18 ms	
Maximum	40 ms	43 ms	

* Worst case averages are derived by dividing the sum of the times for all possible seeks by the total number of seeks for all temperatures and voltage tolerances.

Typical seek times are derived from observed values under normal operating conditions.

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	40,000 power on hours
MTTR	1/2 hour or less
Preventive maintenance	None
Service life	5 years or 40,000 hours

Power Requirements

DC	+12 V (+5%), 1.6 A (Typical operating)
	+5 V (+5%), .7 A (Typical operating)
Power dissipation	21 watts 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	8 to 80%
Storage	8 to 90%
Transit	5 to 95%
Altitude	
Operating	-300 to 3,000m (-1,000 to 10,000 ft)
Transit	-300 to 12,000m (-1,000 to 40,000 ft)
Acoustical Noise	
Operating	50 dBA or less

Physical

Height	82.55mm (3.25 in)
Width	147mm (5.75 in)
Depth	203mm (8 in)
Weight	3.3 kg (7.2 lb)

SCSI COMMANDS SUPPORTED

Format Unit*
 Inquiry*
 Mode Select*
 Mode Sense*
 Read*
 Read Capacity*
 Read Data Buffer*
 Read Defect Data*
 Read Extended*
 Read Long
 Receive Diagnostic Results
 Release Unit*
 Receive Diagnostic Results
 Release Unit*
 Request Sense*
 Reserve Unit
 Rezero Unit
 Seek
 Seek Extended
 Send Diagnostic*
 Start Unit
 Test Unit Ready*
 Verify
 Verify by ECC
 Write*
 Write Data Buffer
 Write Extend*
 Write Long

*Common Command Set

Distributed by:



Specifications subject to change without notice.

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

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