

# Western Digital SCSI Hard Drives

WD Enterprise

- WDE2170
- WDE4360

## *Installation Guide*



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Printed in USA  
4079-001046 10/96

# TECHNICAL SUPPORT SERVICES

When calling for support, we will ask for the model number and serial number from your WD Enterprise WDE2170/4360 SCSI hard drive. The model number is printed on the large product label on the top of the drive, and the serial number is found on the small label containing the bar code. Take a moment to write down these numbers below.

**Model Number:** \_\_\_\_\_

**Serial Number:** \_\_\_\_\_

**Phone/Fax Assistance: 507-286-7972**

**888-WDC-SCSI or 888-932-7274 (in U.S. only)  
507-286-7926 (fax)**

If you need additional information or help during installation or during normal use of this product, contact Western Digital Technical Support. Our customer support staff will attempt to answer your installation questions by phone or issue a service authorization number for repair or replacement of your product. Unauthorized returns will not be accepted.

When calling for support, please have your computer system and operating system information available.

<b>Hours:</b>	Monday - Thursday	9 am - 11:50 am; 1 pm - 6 pm
(CST)	Friday	9 am - 11:50 am; 1 pm - 4 pm
	Saturday	8 am - 11:50 am; 1 pm - 5 pm

**Modem Access: 714-753-1234**

You can access the Technical Support Bulletin Board if you have a Hayes-compatible modem with a 2,400 to 28,800 baud rate. The following setup format is required: 8 Data Bits, No Parity, 1 Stop Bit.

**DocuFAX: 714-932-4300 (North America only)**

An automated FAX system is available so that you can have product information sent directly to your FAX machine.

**On-line Services:**

Internet Address: <http://www.wdc.com/>

FTP Site: <ftp.wdc.com>

America Online: **keyword: Western Digital**

Microsoft Network: **go word: WDC**

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# INTRODUCTION

Please review this installation guide before you install your WD Enterprise hard drive. If you require assistance, contact our technical support staff at 1-888-WDC-SCSI.

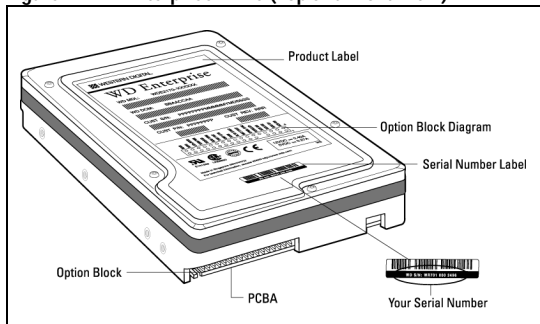
## PRODUCT DESCRIPTION

WD Enterprise™ hard drives are 3.5-inch, high-performance SCSI drives designed for use in workstation, server, multi-user, array, and audio/video applications. They feature outstanding performance, capacity, and reliability.

These drives feature formatted capacities of 2.1 GB and 4.3 GB. They are compliant with SCSI-3 SPI, support Ultra Fast (50-pin) and Ultra Fast Wide (68-pin) host data transfer rates up to 40 MB/s, and offer an SCA-2 (80-pin) interface. The WD Enterprise drives offer an average read seek time of 8 ms and a media transfer rate of up to 140 Mbits/s.

There are currently two models available in the WD Enterprise series: the WDE4360 and WDE2170. The "WDE" prefix represents the Western Digital Enterprise group of products and the four numeric digits denote the drive's capacity in megabytes. The model number listed on the product label may include additional customer-specific information.

**Figure 1. WD Enterprise Drive (Top and Front View)**



## **PRODUCT FEATURES**

The WD Enterprise drive offers the following features:

- **Advanced Caching** — Including Read and Write Caching, Pre-fetch, and Adaptive Caching
- **Command Queuing** — Supports both tagged and untagged queuing; command reordering maximizes the drive performance by minimizing latency and seek time.
- **S.M.A.R.T. (Self Monitoring Analysis and Reporting Technology)** — A hard drive firmware technology that performs drive failure prediction by monitoring selected parameters during normal drive operations.
- **SCAM (SCSI Configure Automatically) Level 2 Compliant** — Eases user configuration of SCSI ID's and hot plugging on single and multiple drive systems.



- Error Correction Code (ECC) — ECC on-the-fly is a feature that allows some ECC errors to be corrected in hardware with no delays to data transfer.
- 512 KB Data Buffer — The entire data buffer is user accessible. A 1 MB option is also available.

For more technical information and specifications on the WD Enterprise drives, see the *Reference* section of this manual.

# GENERAL INFORMATION

## HANDLING PRECAUTIONS

The WD Enterprise hard drive is designed to withstand normal handling during unpacking and installation. Care must be taken to avoid excessive mechanical shock or electrostatic discharge (ESD) that can permanently damage the drive and void the warranty.

Be aware of the following precautions when unpacking and installing the WD Enterprise drive:

- Do not unpack the hard drive until you are ready to install it.
- Handle the drive by the sides only and avoid touching the circuit board components and connectors.
- Do not attempt to remove the drive cover. Servicing components in the sealed compartment requires special cleanroom facilities. Failure to observe this restriction will void the warranty.
- For additional handling information, refer to the *Western Digital 3.5-inch Drive Handling Guide (document number SO999)*.

## ESD Protection

To prevent drive damage it is essential to keep the drive in an ESD safe environment. Several precautions can be taken to avoid permanent damage to the drive.

- Keep the drive in the shielded anti-static bag prior to testing or installation.
- Gently place the drive on a padded, grounded anti-static surface when it is not in its shipping container.
- A grounded wrist strap must be worn throughout all phases of drive handling to eliminate static. The wrist strap must fit snugly and be in direct contact with the skin.
- Articles of clothing generate static electricity. Do not allow clothing to come in direct contact with the drive or printed circuit board assembly (PCBA).
- Do not insert any other items in the shielded anti-static bag with the drive.

## BEFORE INSTALLING THE DRIVE

*NOTE: Record the hard drive's model number and serial number before you begin the installation.*

Be sure that you have the following items prior to installing the WD Enterprise drive:

- Computer system manual
- Operating system manual
- Host bus adapter manual
- Non-magnetic screwdriver

You may also need:

- Jumper shunts, if you change the drive configuration. Jumper shunts are available from your local computer dealer or from Western Digital technical support.
- Interface cable (for 50-pin or 68-pin models)
- A drive tray or mounting rails, depending upon system requirements
- Additional power cable(s)

# PREPARING FOR INSTALLATION

## OVERVIEW

This section provides the steps necessary to prepare the WD Enterprise hard drive for installation in your system.

Because the WD Enterprise WDE2170 and WDE4360 drives are compatible with a wide range of computer systems, this manual does not include system-specific information. Refer to your computer system documentation for more information.

This section discusses the following installation procedures:

- Mounting Restrictions
- Setting the Drive Jumpers
- SCSI Cable Length Restrictions
- Connector Types
- Multiple Drive Installations

## **MOUNTING RESTRICTIONS**

The WD Enterprise drive is a precision mechanical assembly. Since improper mounting may distort the drive frame and impair its proper function, mounting the drive securely will ensure maximum performance.

Western Digital provides technical support to those customers requiring assistance with mounting design. Some customers may wish to review their system mechanical design and system grounding architecture to optimize drive performance and ensure compliance with the various electromagnetic compatibility regulations in the markets being served.

### **Ventilation**

The ambient temperature surrounding the drive must not exceed 131°F (55°C). The enclosure used to house the drive should supply sufficient airflow around the drive and printed circuit board assembly (PCBA) to maintain temperatures at or below the temperatures defined in the *Reference* section of this manual. Operation above this level may adversely affect the drive's performance.

### **Orientation**

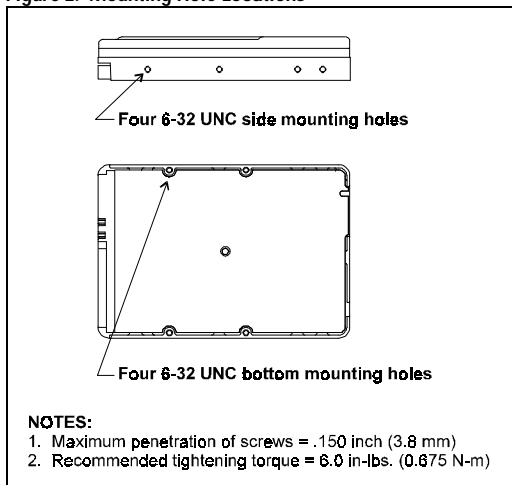
The drive features both bottom and side mounting holes. Refer to Figure 2 for mounting hole locations.

## Mounting

Four 6-32 UNC screws are used to mount the drive. To avoid stripping the mounting-hole threads, the maximum torque applied to the screws should not exceed 6.0 in-lb. (0.675 N-m). Be aware of the following:

- The drive features four mounting holes on either side of the drive and four mounting holes on the bottom.
- The maximum allowable penetration of the screws is 0.150" (3.8 mm). This length allows full use of the mounting-hole threads, while avoiding damage or stress to the PCBA.

Figure 2. Mounting Hole Locations

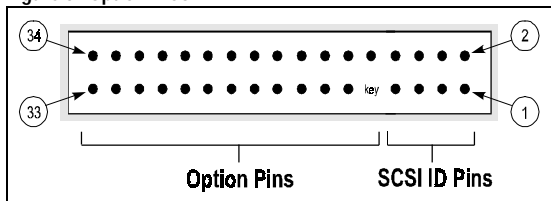


## SETTING THE DRIVE JUMPERS

*NOTE: Before installing your WD Enterprise drive, you should review the SCSI concepts presented in this section. The information will help you configure each WD Enterprise drive to operate properly in your system.*

The drive is designed for use in a variety of systems. Therefore, several configuration options can be set using the option block on the front of the drive (end opposite the SCSI connector). In most cases you will not need to change the default settings for normal drive operation. However, some installations may require you to install or remove certain jumpers in order to meet system specifications. Refer to Figure 3.

Figure 3. Option Block





## SCSI ID Numbers

Each device on the SCSI bus requires a unique SCSI ID number (0 to 7 for 8-bit devices, 0 to 15 for 16-bit devices).

Option block pins 1 through 8 are used to set the SCSI IDs. Refer to Table 1 for a complete matrix of jumper settings.

The host computer's SCSI controller typically uses ID number 7, and the other numbers are used for devices such as hard drives. The WD Enterprise drive has a default SCSI ID of 0.

Table 1. SCSI ID Jumpers

SCSI ID	JUMPER LOCATION			
	Pins 7 & 8	Pins 5 & 6	Pins 3 & 4	Pins 1 & 2
0	○	○	○	○
1	○	○	○	●
2	○	○	●	○
3	○	○	●	●
4	○	●	○	○
5	○	●	○	●
6	○	●	●	○
7	○	●	●	●
8	●	○	○	○
9	●	○	○	●
10	●	○	●	○
11	●	○	●	●
12	●	●	○	○
13	●	●	○	●
14	●	●	●	○
15	●	●	●	●

● jumper installed   ○ jumper removed    legal 8-bit bus IDs\*

\* If any device on your computer's SCSI bus supports only 8-bit SCSI IDs, the WD Enterprise drive must be set to one of these values.

*NOTE: The WD Enterprise drive supports the SCSI Configured Automatically (SCAM) option, which automatically assigns SCSI ID numbers and resolves ID conflicts upon bootup. If your SCSI controller and other SCSI devices support SCAM, you do not need to manually assign a SCSI ID to the hard drive. SCAM is discussed on page 15.*

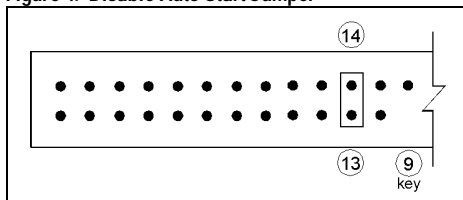
*NOTE: The remaining figures in this section show the option pins only. Refer to Figure 3 for a complete representation of the option block.*

## Disable Auto Start

The WD Enterprise drive can be configured to Auto Start, or automatically spin up when power is applied to the drive. If the drive is configured to disable Auto Start, it powers up, but will not spin up until a start unit command is issued by an operator.

Option block pins 13 and 14 are dedicated to the Auto Start option. To disable Auto Start, install a jumper as shown in Figure 4. To enable Auto Start, no jumper is required.

Figure 4. Disable Auto Start Jumper



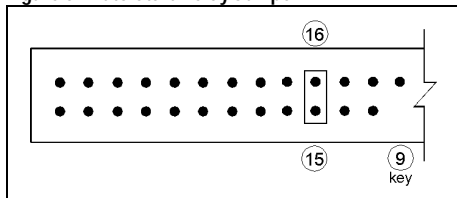
## Auto Start Delay

This feature delays the start-up process to avoid an initial power surge when several drives are powered up at once. The delay time (default) is 4 seconds between drives, or the SCSI ID multiplied by 4 seconds. Let's say you have three hard drives in your system, and they are set to SCSI IDs 0, 1, and 2. The drive assigned as ID 0 will power up immediately; the drive assigned to ID 1 will power up in 4 seconds; and the drive assigned to ID 2 will power up in 8 seconds.

*NOTE: The 4 second delay time can be changed in the drive's mode parameter settings.*

Option block pins 15 and 16 are dedicated to the Auto Start Delay option. (This option is valid only if the Disable Auto Start jumper is **not** installed.) To enable Auto Start Delay, install a jumper as shown in Figure 5. To disable Auto Start Delay, no jumper is required.

Figure 5. Auto Start Delay Jumper



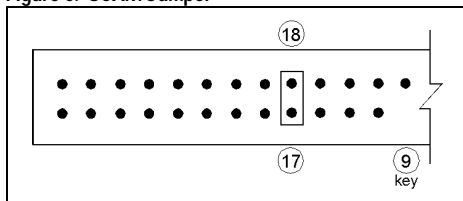
## SCAM

The WD Enterprise drive supports the SCSI Configured Automatically (SCAM) option, which allows it to function as a SCAM level 2 device.

*NOTE: In order to use this feature, the host bus adapter must support SCAM.*

Option block pins 17 and 18 are dedicated to the SCAM feature. To enable SCAM, install a jumper as shown in Figure 6. To disable SCAM, no jumper is required.

Figure 6. SCAM Jumper

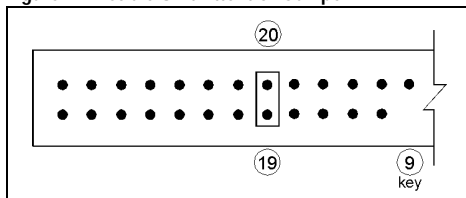


## Disable Unit Attention

Whenever a target (WD Enterprise drive) has been reset by a power-on or reset sequence, it communicates a unit attention message to the initiator (host bus adapter).

Option block pins 19 and 20 are dedicated to the Disable Unit Attention option. To disable unit attention, install a jumper as shown in Figure 7. To enable unit attention, no jumper is required.

Figure 7. Disable Unit Attention Jumper

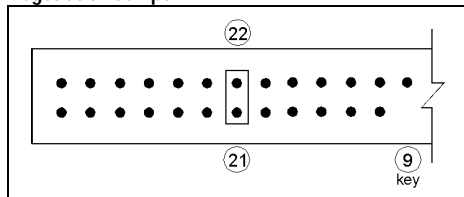


## Disable Target Initiated Synchronous/Wide Negotiation

During the power up sequence, the initiator (host bus adapter) and the target (WD Enterprise drive) negotiate and agree upon three items: bus width, bus speed, and synchronous/asynchronous data transfer. Either the initiator or the target can start the negotiation process, and once this process is completed successfully, all “data in” and “data out” phases will operate as determined during the handshake. The negotiation process is done only once, usually during start-up.

Option block pins 21 and 22 are dedicated to the Disable Target Initiated Synchronous/Wide Negotiation option. To disable target initiated synchronous/wide negotiation, install a jumper as shown in Figure 8. To enable target initiated synchronous/wide negotiation, no jumper is required.

Figure 8. Disable Target Initiated Synchronous/Wide Negotiation Jumper

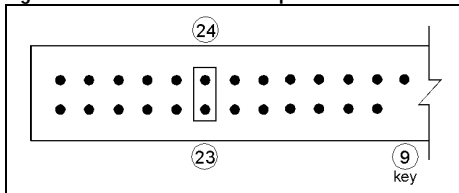


## SCSI Termination

To ensure reliable communication, the SCSI bus must be properly terminated. Devices located at the physical ends of the SCSI bus should have their terminators enabled. All other devices must have their terminators disabled.

Option block pins 23 and 24 are dedicated to the SCSI Termination option. To enable SCSI termination, install a jumper as shown in Figure 9. To disable SCSI termination, no jumper is required.

Figure 9. SCSI Termination Jumper





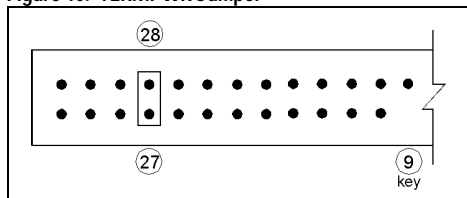
## Termination Power (TERMPWR)

WD Enterprise drives have the ability to supply +5V to the SCSI bus for termination. Option block pins 27 and 28 are dedicated to TERMPWR. If you want the drive to supply TERMPWR to the SCSI bus, install a jumper as shown in Figure 10. To disable TERMPWR, no jumper is required.

Consult your system or host bus adapter documentation to determine if the SCSI bus supplies termination power. (Most systems do supply termination power). If your system does not, then you must use the power supplied by the WD Enterprise drive.

*NOTE: Termination power from the hard drive is required only if the host bus adapter does not supply it. However, both devices can provide termination power with no detrimental effects to the system.*

Figure 10. TERMPWR Jumper



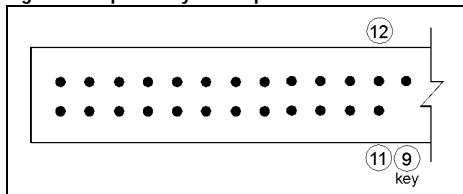
## Spindle Synchronization

If you are installing two or more WD Enterprise hard drives, you can synchronize their spindles to reduce the latency associated with switching from one drive to another. Spindle sync allows the host to synchronize the index pulses of the drives at a specified offset. This means that the same numbered sector passes under the read/write head at the same time across all drives. For more details regarding the sync offset, refer to the *Western Digital SCSI Implementation Guide (document number 4096-0011116)* and the *WD Enterprise Technical Reference Manual (document number 4079-001045)*.

*NOTE: The spindle sync feature is intended for use with like WD Enterprise drives only.*

Option block pin 12 is dedicated to Spindle Sync, as shown in Figure 11. To enable spindle sync, pin 12 must be connected on all drives that are to be in sync. (Pin 11 is ground).

Figure 11. Spindle Sync Jumper

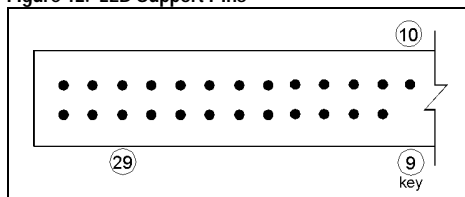


## LED Support

If your system configuration allows the use of an activity LED external to the WD Enterprise drive, you can power the LED from the drive. Pins 10 and 29 are dedicated to LED support, as shown in Figure 12. To install an external activity LED, connect the positive lead (anode) of the LED to pin 29 and the negative lead (cathode) to pin 10.

*NOTE: These pins can be used to power an LED located on the front of the drive, or an external LED in systems where the front of the drive cannot be seen.*

Figure 12. LED Support Pins



## Reserved Pins

There are a number of pins on the option block that are reserved for development and manufacturing purposes:

- Pins 25 and 26
- Pin 30
- Pins 31 and 32
- Pins 33 and 34
- Key slot (prevents incorrect installation of connector)

## Mode Select Options

Certain configuration parameters can be altered by using the SCSI Mode Select command. Some examples include Read/Write Error Recovery Page, Format Device Page, and Caching Page. The Mode Select command allows drive characteristics to be customized to meet your system requirements. Refer to the *Western Digital SCSI Implementation Guide (document number 4096-001116)* for more information.

## Remote Option Block

WD Enterprise 68-pin drives are equipped with a remote option block that allows you to set SCSI IDs and enable select options such as termination, spindle synchronization, and LED power. Customers using the remote option block typically use a pre-fabricated cable for convenient connection to the host. Do not use jumpers on this option block. For more information, refer to the *WD Enterprise Technical Reference Manual (document number 4079-001045)*.

## SCSI CABLE LENGTH RESTRICTIONS

Single-ended SCSI drives allow cable lengths of up to 6 meters (19.68 feet). Users who plan to use “Fast” and “Ultra Fast” data transfers with single-ended models should follow all the ANSI SCSI guidelines for these operations. Differential SCSI drives allow cable lengths of up to 25 meters (82.02 feet). Cables must meet the requirements for differential cables as set forth in the ANSI SCSI standard.

Drives equipped with a SCA-2 connector are not designed for direct cable attachment due to the combination of power and SCSI bus signals.

The ANSI SCSI standard states that any stub from the main cable must not exceed 0.1 meters (.32 feet) for single-ended cables and 0.2 meters (.65 feet) for differential cables.

**Table 2. SCSI Bus Length Specifications**

Bus Type	Property	Single-ended	Differential
SCSI-1	Maximum bus length	6m (19.68 ft.)	25m (82.02 ft.)
SCSI-2	Maximum bus length	6m (19.68 ft.)	25m (82.02 ft.)
Fast SCSI-2	Maximum bus length	3m (9.84 ft.)	25m (82.02 ft.)
Ultra SCSI	Maximum bus length (point-to-point)	3m (9.84 ft.)	25m (82.02 ft.)
	Maximum bus length (multi-drop)	1.5m (4.92 ft.)	25m (82.02 ft.)
All	Max. stub length	0.1m (.32 ft.)	0.2m (.65 ft.)
	Min. stub spacing	0.3m (.98 ft.)	0.3m (.98 ft.)

## **CONNECTOR TYPES**

### **50-pin SCSI Connector**

50-pin models use a high density connector which is compatible with ANSI SCSI "A" style connector specifications. It can transfer data in 8-bit (narrow) mode only.

### **68-pin SCSI Connector**

68-pin models use a high density connector which is compatible with ANSI SCSI "P" style connector specifications. It can transfer data in 8-bit (narrow) and 16-bit (wide) modes. Both single-ended and differential SCSI versions are available.

### **80-pin SCSI Connector**

80-pin models use a Single Connector Attachment (SCA-2) connector which is designed for backplane connections. It can transfer data in 8-bit (narrow) and 16-bit (wide) modes.

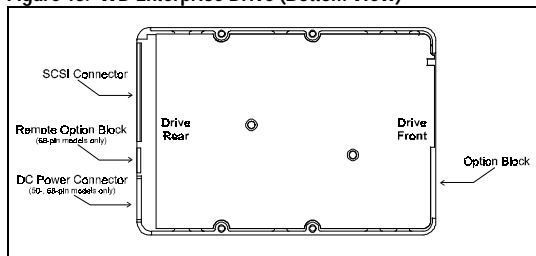
## **MULTIPLE DRIVE INSTALLATIONS**

If your system requires multiple devices, you may install up to eight SCSI devices (including the host bus adapter) on an 8-bit SCSI bus; up to sixteen SCSI devices (including the host bus adapter) on a 16-bit SCSI bus, or up to 32 devices (including the host bus adapter) on a 16-bit SCSI bus with a dual processor host bus adapter. Refer to the "SCSI ID Numbers" discussion on page 11.

## INSTALLING THE DRIVE

Because the Enterprise WDE2170 and WDE4360 drives are compatible with a wide range of computer systems and host bus adapters, this manual does not include system-specific information. If the information contained in the following sections does not adhere to your setup, refer to your computer system documentation for further details.

**Figure 13. WD Enterprise Drive (Bottom View)**





## Opening the Computer System

- 1) Turn OFF the power to the computer system and all attached peripheral devices.
- 2) Unplug the AC power cable from the wall outlet.
- 3) Remove all cables from the back of the computer system.
- 4) Remove the screws attaching the computer system's cover using a non-magnetic screwdriver. Be sure to keep all screws and other parts together for easy re-assembly.
- 5) Gently lift the cover and remove it from the chassis.

## Preparing the Drive for Installation

*NOTE: Before unpacking the hard drive, refer to the section entitled Handling Precautions on page 4.*

- 1) Remove the WD Enterprise drive from the anti-static bag, and place the drive on top of the anti-static bag on your work surface.
- 2) Configure the drive jumpers as necessary. Refer to the section entitled *Setting the Drive Jumpers* on page 10 for more details.
- 3) If SCSI termination must be provided by the WD Enterprise drive, ensure that the terminator is properly installed. Refer to the "SCSI Termination" discussion on page 18.

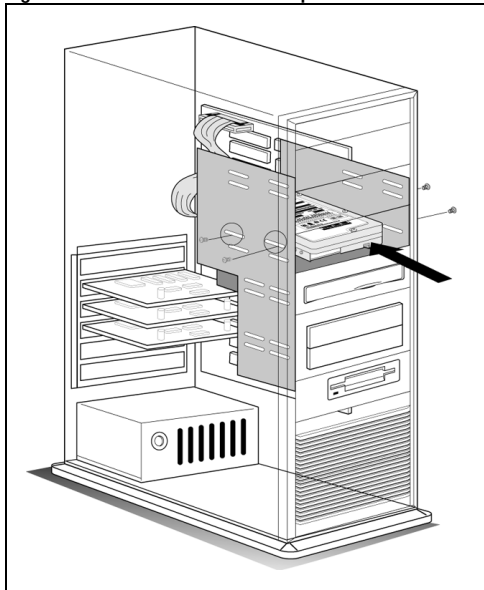
## If Your Drive has a 50-pin or 68-pin Connector

- 1) Using a non-magnetic screwdriver and four mounting screws, mount the 50-pin or 68-pin drive in the computer system's mounting frame as shown in Figure 14. Use four 6-32 mounting screws. Do not install the screws past .150-inch.

*NOTE: When mounting the drive, make sure the SCSI connector and power connector face the rear of the chassis.*

*NOTE: If you plan to install the WD Enterprise drive in a 5.25-inch bay, you must install the mounting hardware. Contact your local dealer to obtain a mounting adapter kit. Rails are sometimes necessary to complete the installation. Consult your computer system manufacturer.*

**Figure 14. Installation of 50- or 68-pin Drive**



- 2) Obtain the appropriate type of SCSI ribbon cable, 50-pin or 68-pin.
- 3) Identify pin 1 on the ribbon cable. The colored stripe indicates pin 1.
- 4) Connect the ribbon cable connector to the hard drive by matching pin 1 on the ribbon cable with pin 1 on the hard drive connector. Refer to Figure 15 and Figure 16 to correctly identify pin 1 for each connector type.

Figure 15. Attaching the 50-pin SCSI Cable

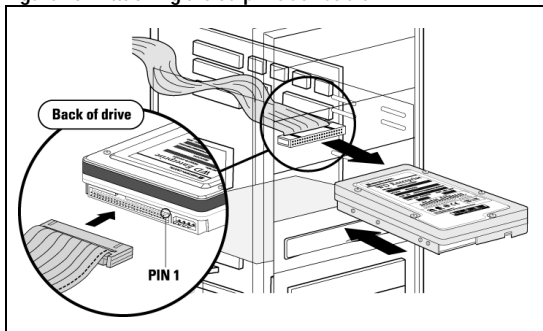
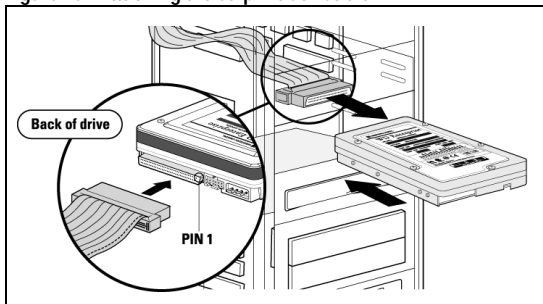


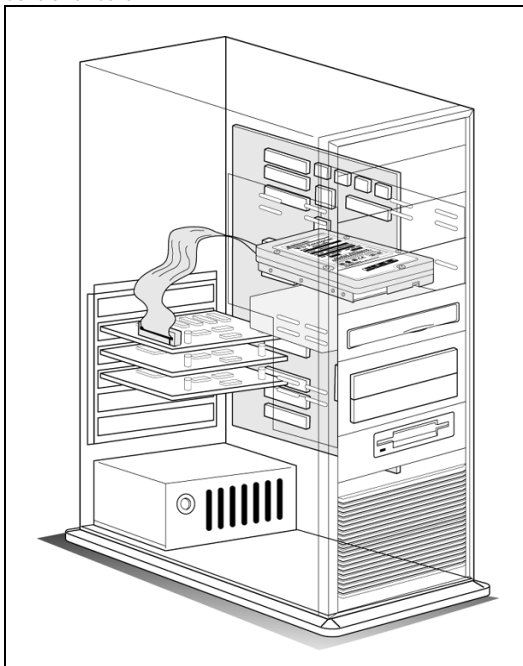
Figure 16. Attaching the 68-pin SCSI Cable



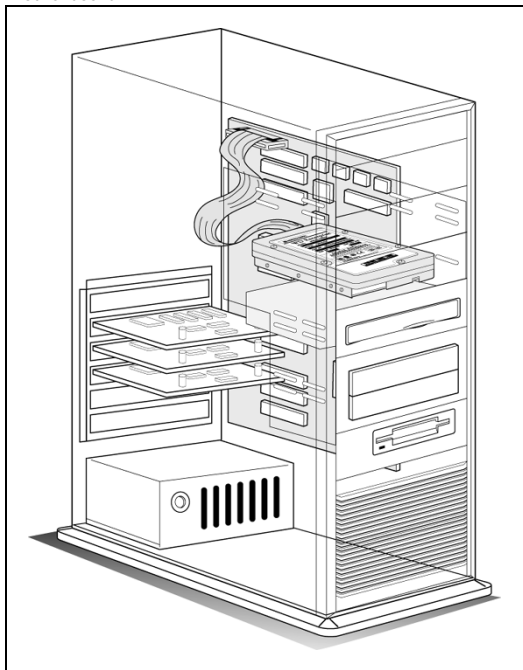
*NOTE: If multiple devices are attached to the SCSI bus, they must be daisy-chained using a ribbon cable with multiple connectors. The ends of the cable must be connected to terminated devices. If the cable contains more connectors than needed for the devices on the bus, mid-cable connectors may remain unused. Consult your computer system or adapter card documentation for specific cabling requirements.*

- 5) Connect the remaining ribbon cable connector to the SCSI controller card or the motherboard by matching pin 1 on the ribbon cable with pin 1 on the SCSI connector. Refer to Figure 17 and Figure 18.

**Figure 17. Attaching a 50- or 68-pin SCSI Cable to a SCSI Controller Card**



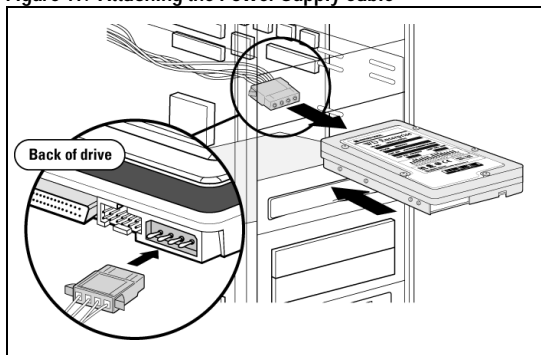
**Figure 18. Attaching a 50- or 68-pin SCSI Cable to the Motherboard**



*NOTE: Before completing steps 6 and 7, ensure that power to the computer system is turned off. Hot-plugging power to the drive is not recommended.*

- 6) Locate an available 4-pin power supply connector cable inside the computer system.
- 7) Connect the 4-pin power cable to the power connector on the drive. Although the 4-pin connector is keyed to ensure proper insertion, refer to Figure 19 for correct alignment.

**Figure 19. Attaching the Power Supply Cable**



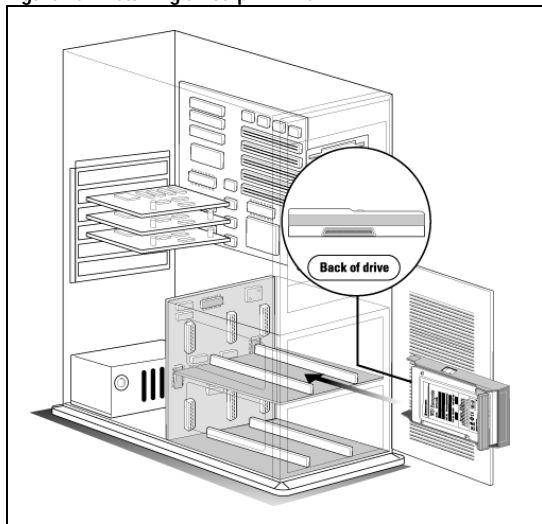


## If Your Drive has an 80-pin Connector

*NOTE: The SCSI connection and power connection is handled by a single SCA-2 connector.*

- 1) Mount the 80-pin drive in a drive tray using four mounting screws.
- 2) Slide the drive/tray assembly into the designated drive slot, making sure that the end with the SCSI connector is inserted first. Refer to Figure 20.

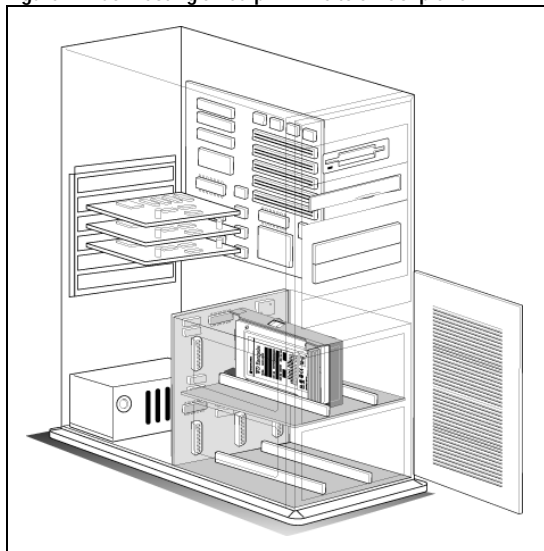
**Figure 20. Installing an 80-pin Drive**



3) Ensure that the drive is properly seated on the backplane connector. Refer to Figure 21.

*NOTE: This connection must be secure.*

Figure 21. Connecting an 80-pin Drive to a Backplane



## **Closing the Computer System**

- 1) Verify all cable connections.
- 2) To prevent damage to the SCSI ribbon cables and power cables, make sure all cables are neatly placed inside the computer system's chassis.
- 3) Replace the cover and install screws using a non-magnetic screwdriver.
- 4) Re-connect all cables to the back of the computer system.
- 5) Plug the AC power cable into the wall outlet.
- 6) Turn ON the power to the computer system.

## USING THE DRIVE

To prepare your drive for use, you must install your operating system, application software, and if necessary, host bus adapter software. Consult your system and software documentation for additional information.

It is extremely important to regularly back up the data on your hard drive. Data can be damaged or lost due to a number of unanticipated factors. Consult your operating system documentation for back up instructions.

## REFERENCE

This section contains specifications for the Enterprise hard drives, models WDE2170 and WDE4360. All values apply to both models, unless otherwise noted. For more detailed specifications, refer to the *WD Enterprise Technical Reference Manual (document number 4079-001045)*.

## PHYSICAL SPECIFICATIONS

	WDE2170	WDE4360
Formatted Capacity <sup>1</sup> :	2170 MB	4360 MB
Interface(s):	Ultra Fast • (50-pin) Ultra Fast Wide • (68-pin) <sup>2</sup> • (80-pin SCA-2) <sup>2</sup>	Ultra Fast • (50-pin) Ultra Fast Wide • (68-pin) <sup>2</sup> • (80-pin SCA-2) <sup>2</sup>
Rotational Speed:	7200 RPM	7200 RPM
Bytes per Sector:	512	512

<sup>1</sup> *Western Digital defines a megabyte (MB) as 1,000,000 bytes and a gigabyte (GB) as 1,000,000,000 bytes.*

<sup>2</sup> *Differential option available on 68-pin and 80-pin models.*

## RELIABILITY SPECIFICATIONS

MTBF:	1,000,000 hours
Service Life:	5 years
Preventive Maintenance:	None required

## PHYSICAL DIMENSIONS

	<u>WDE2170</u>	<u>WDE4360</u>
Form Factor:	3.5 inches	3.5 inches
Height:	1.00 ± 0.02 inches 25.4 ± 0.50 mm	1.00 ± .02 inches 25.4 ± 0.50 mm
Length:	5.75 ± 0.02 inches 146.05 ± 0.50 mm	5.75 ± 0.02 inches 146.05 ± 0.50 mm
Width:	4.00 ± 0.01 inches 101.6 ± 0.25 mm	4.00 ± 0.01 inch 101.6 ± 0.25 mm
Weight:	1.1 ± .11 pounds 0.48 ± 0.05 kg	1.2 ± 0.11 pounds .53 ± 0.05 kg

## PERFORMANCE SPECIFICATIONS

Spindle Start Time:	< 30s to ready
Spindle Stop Time:	< 20s

## POWER REQUIREMENTS (TYPICAL)

	<u>WDE2170</u>	<u>WDE4360</u>	<u>WDE2170</u>	<u>WDE4360</u>
	Single-ended	Single-ended	Differential	Differential
Voltage:	5V, 12V ±5%	5V, 12V ±5%	5V, 12V ±5%	5V, 12V ±5%
Idle:	5.4W	7.1W	6.2W	7.5W
Seek:	7.1W	8.7W	8.0W	9.4W

## POWER CONNECTORS AND CABLE

### 50-pin

Power Connector:	AMP 2-in-1 (or equivalent)
Mating Connector:	1 by 4 PC power connector
Power Cable:	18 AWG

### 68-pin

Power Connector:	Molex 3-in-1 combo (or equivalent)
Mating Connector:	1 by 4 PC power connector
Power Cable:	18 AWG

### 80-pin

SCA-2 Connector

# ENVIRONMENTAL SPECIFICATIONS

## Shock

Operating:	10G (3 ms)
Non-operating:	70G (3 ms)
Non-operating Rotational Shock:	10,000 rad/s <sup>2</sup> (3 ms)

## Vibration

Operating:	Sine Sweep 5-20 Hz, 0.037 inch (double amplitude displacement) 20-400 Hz, 0.75G (zero-to-peak)
Non-operating:	Sine Sweep 5-20 Hz, 0.098 inch (double amplitude displacement) 20-400 Hz, 2.0G (zero-to-peak)
Sweep Rate:	One octave/minute minimum

## Operating Temperature and Humidity<sup>1</sup>

Temperature:	5°C to 55°C (41°F to 131°F)
Humidity:	10-90% RH non-condensing 33°C (maximum wet bulb)
Thermal Gradient:	10°C/hour (maximum)

## Non-Operating Temperature and Humidity<sup>1</sup>

Temperature:	-40°C to 60°C (-40°F to 140°F)
Humidity:	5-95% RH non-condensing 33°C (maximum wet bulb)
Thermal Gradient:	20°C/hour (maximum)

## Atmospheric Pressure

Operating Altitude:	-1,000 feet to 10,000 feet (-300m to 3,000m)
Non-operating Altitude:	-1,000 feet to 40,000 feet (-300m to 12,000m)

## Acoustics (Typical)<sup>2</sup>

Idle:	4.0 bels
Seek:	5.0 bels

<sup>1</sup> *The system environment must allow sufficient air flow to maintain component temperature at levels specified in the WD Enterprise Technical Reference Manual (document number 4079-001045).*

<sup>2</sup> *Sound power level.*

## TROUBLESHOOTING

If you encounter a problem during installation of your WD Enterprise drive, first review your computer system documentation to ensure that you followed the setup procedures correctly, then use this checklist:

- Is the system plugged in and are all power connections secure?
- Is the host bus adapter installed correctly? Check to see that the adapter card is seated properly. Also check for a possible system resource conflict such as I/O port, IRQ, or DMA.
- Are the SCSI cables correctly connected to all devices? Make sure that pin 1 is oriented correctly and that the connector is seated properly.
- Have the SCSI ID jumpers been properly installed? Verify that there are no conflicting SCSI ID settings among the devices.
- Are the devices on the ends of the SCSI cables terminated properly?
- Have the terminators been removed from devices in the middle of the cable?
- Is the SCSI cable too long? Refer to Table 2 on page 23.
- Are you receiving an error code? If so, refer to your operating system documentation for an explanation of the code.
- Have the option jumpers been installed properly?



If a problem persists, contact the manufacturer of the host bus adapter to verify the hardware and software setup is correct.

If you have additional questions, contact your local dealer, the Western Digital web site (at [www.wdc.com](http://www.wdc.com)), or Western Digital Technical Support at 1-888-WDC-SCSI for assistance.

## REGULATORY AGENCY INFORMATION

The drive has met the following regulatory agency standards:

- **Underwriters Laboratories:**  
UL-Standard 1950, Standard for Safety of Information Technology Equipment including Electrical Business Equipment  
File Number E101559
- **Federal Communication Commission:**  
Verified to comply with FCC Rules for Radiated and Conducted Emission, Part 15, Subpart B, for Class B Equipment
- **Canadian Standards Association:**  
CSA-Standard C22.2, No. 950 - M89, Standard for Safety of Information Technology Equipment including Electrical Business Equipment  
File Number LR 68850
- **TUV Essen Laboratories:**  
IEC 950 (EN 60 950) Standard for Safety of Information Technology Equipment including Electrical Business Equipment
- **CE Compliance for Europe:**  
Verified to comply with EN 55022 for RF Emissions and EN 50082-1 for Generic Immunity as applicable.

# **RADIO FREQUENCY INTERFERENCE STATEMENT**

## **FCC Notice**

This Western Digital Enterprise product has been verified to comply with the limits for a Class B computing device pursuant to subpart B Part 15 of FCC rules. This does not guarantee that interference will not occur in individual installations. Western Digital is not responsible for any television, radio, or other interference caused by unauthorized modifications of this product.

If interference problems do occur, please consult the system equipment owner's manual for suggestions. Some of these suggestions include relocation of the computer system away from the television or radio, or placing the computer AC power connection on a different circuit or outlet.

## **CSA Notice**

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe B prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada

This digital apparatus does not exceed the Class B limits for radio noise for digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

# WARRANTY INFORMATION

## WD ENTERPRISE HARD DRIVES

### OBTAINING SERVICE

Western Digital Corporation ("WDC") values your business and always attempts to provide you the very best of service. If this Product ever requires maintenance, either contact the dealer from whom you originally purchased the Product or telephone WDC's Technical Support Department. No Product may be returned directly to WDC without first contacting our Technical Support Department at (714) 932-4900 or at (800) 275-4932. If it is determined that the Product may be defective, you will be given a Return Material Authorization ("RMA") number and instructions for Product return. An unauthorized return, i.e., one for which an RMA number has not been issued, will be returned to you at your expense. Authorized returns are to be shipped prepaid and insured to the address on the RMA and are to be packaged securely to prevent damage. In order to conclusively establish the period of warranty, an original purchase receipt must accompany the returned Product. WDC shall have no liability for lost data, regardless of the cause, recovery of lost data, or data contained in any Product placed in its possession.

## LIMITED WARRANTY

WDC warrants that the Product, in the course of its normal use, will be free from defects in material and workmanship for a period of five (5) years and will conform to WDC's specification therefor. This limited warranty shall commence on the purchase date appearing on your purchase receipt.

WDC shall have no liability for any Product returned if WDC determines that the asserted defect a) is not present, b) cannot reasonably be rectified because of damage occurring before WDC receives the Product, or c) is attributable to misuse, improper installation, alteration (including removing or obliterating labels), accident or mishandling while in your possession. Subject to the limitations specified above, your sole and exclusive warranty shall be, during the period of warranty specified above and at WDC's option, the repair or replacement of the Product. The foregoing warranty of WDC shall extend to repaired or replaced Products for the balance of the applicable period of the original warranty or thirty (30) days from the date of shipment of a repaired or replaced Product, whichever is longer.

**THE FOREGOING LIMITED WARRANTY IS WDC'S SOLE WARRANTY AND IS APPLICABLE ONLY TO PRODUCTS SOLD AS NEW. THE REMEDIES PROVIDED HEREIN ARE IN LIEU OF a) ANY AND ALL OTHER REMEDIES AND WARRANTIES, WHETHER EXPRESSED, IMPLIED OR STATUTORY, INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF**

**MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, AND b) ANY AND ALL OBLIGATIONS AND LIABILITIES OF WDC FOR DAMAGES INCLUDING, BUT NOT LIMITED TO ACCIDENTAL, CONSEQUENTIAL, OR SPECIAL DAMAGES, OR ANY FINANCIAL LOSS, LOST PROFITS OR EXPENSES, OR LOST DATA ARISING OUT OF OR IN CONNECTION WITH THE PURCHASE, USE OR PERFORMANCE OF THE PRODUCT, EVEN IF WDC HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.**

In the United States, some states do not allow exclusion or limitations of incidental or consequential damages, so the limitations above may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

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