

Jumper Settings

WD SATA and EIDE Hard Drives

Jumper settings determine the order in which EIDE hard drives and other devices attached to a single interface cable are detected by a computer system. On SATA hard drives, jumper settings enable or disable enterprise-level features.

Setting the jumpers correctly on a hard drive requires the proper placement of a plastic-encased, metal jumper shunt over two pins on the hard drive jumper block, as shown in Figure 1.

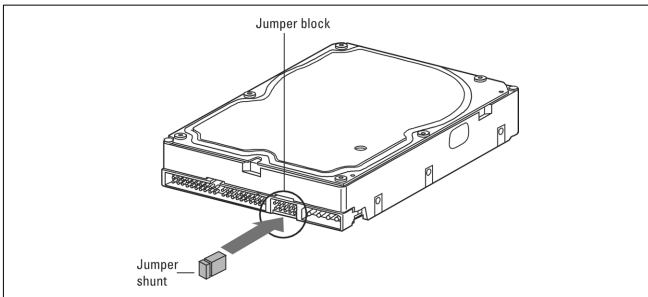


Figure 1. Jumper Block Location

SATA Hard Drive Jumper Settings

WD SATA hard drives are factory set for workstation/desktop use. For enterprise storage requirements, the jumpers can be set to enable spread spectrum clocking or power-up in standby modes.

WD SATA drives are shipped from the factory either with or without a jumper shunt in the spread spectrum clocking (SSC) enable/disable position (on pins 1 and 2). It is not necessary to add or remove the jumper shunt on the drive for workstation/desktop use. For enterprise storage environments, use the following advanced settings:

SSC Mode (Default 1): spread spectrum clocking feature enabled or disabled. Default 1 setting is disabled or jumper shunt placed on pins 1–2. Removing the jumper enables the spread spectrum clocking feature.

SSC Mode (Default 2): spread spectrum clocking feature enabled or disabled. Default 2 setting is disabled or no jumper shunt placed on pins 1–2. Adding the jumper to pins 1–2 enables the spread spectrum clocking feature.

PM2 Enabled Mode: to enable power-up in standby (power management 2 or PM2) mode, place a jumper on pins 3–4. This mode enables controlled spinup by spinup command in accordance with ATA standard and is mainly for server/workstation environments operating in multiple-drive configurations.

Note: The PM2 feature is not available on all WD SATA drives.

Important: PM2 mode requires a compatible BIOS that supports this feature. If PM2 is enabled and not supported by BIOS, the drive does not spin up and therefore is not detected by the system.

OPT1: 150 MB/s data transfer speed enabled or disabled. Default setting is disabled. To enable 150 MB/s data transfer speed, place a jumper on pins 5–6.

OPT2: reserved for factory use (pins 7–8).

KEY: ◻ Jumper pins ◻ Jumper added

Note: WD SATA drives are shipped from the factory with either Default 1 or Default 2 (see below) set as the standard configuration.

1		<p>Default 1</p> <p>Standard configuration 1 (no jumper added). Spread spectrum clocking disabled.</p>
2		<p>SSC enabled</p> <p>Spread spectrum clocking enabled.</p>
3		<p>Default 2</p> <p>Standard configuration 2 (jumper on pins 1-2). Spread spectrum clocking disabled.</p> <p><small>* Neutral storage placement. In this position, the jumper has no effect on hard drive operation.</small></p> <p>PM2 (Enabled)</p> <p>PM2 enabled (jumper on pins 3-4). Controlled spinup via spinup command (ATA standard).</p>
4		<p>SSC enabled</p> <p>Spread spectrum clocking enabled.</p> <p>OPT1 (Enabled)</p> <p>150 MB/s data transfer speed enabled (jumper on pins 5-6).</p>

Figure 2. SATA Hard Drive Jumper Settings

EIDE Hard Drive Jumper Settings

WD EIDE hard drives are factory set with Cable Select (CSEL) jumper settings. The CSEL jumper setting protocol requires the use of a special interface cable. All hard drives in a CSEL-compliant system have the jumpers set in the same position.

Not all computer systems support Cable Select. The Master/Slave jumper setting protocol must be used if a system does not support CSEL or if CSEL support cannot be determined. The Master/Slave protocol works regardless of whether or not the system, devices, or cable selects CSEL.

Some systems with legacy BIOSs lock up on initial boot or report a smaller drive capacity than the actual capacity of the hard drive. In such cases, alternate jumper settings must be used in conjunction with WD's Data Lifeguard Tools software.

Three common jumper setting configuration protocols are used for EIDE drives:

- **Single:** the hard drive is the only device on the IDE interface cable.
- **Master/Slave:** the hard drive is either a Master (C:/) drive or a Slave drive in a multiple-drive system.
- **Cable Select (CSEL/CS):** jumper settings are the same on all hard drives in a system (both single- and multiple-drive systems); however, a special CSEL cable must be used, and the host system must support CSEL. WD EIDE hard drives are factory set for Cable Select configuration.

Note: Not all computer systems and motherboards support the CSEL option.

Cable Select System Support

Consult the system documentation or contact the system manufacturer to determine whether a computer supports CSEL.

Checking the jumper position on an existing hard drive or other EIDE device (such as a CD-ROM drive) is another method to determine whether a system supports CSEL. If a diagram or explanation of jumper settings on top of the hard drive or IDE device verifies that it is jumpered for Cable Select, then the system supports CSEL protocol.

The Master/Slave configuration protocol must be used when a system does not support CSEL or when CSEL support cannot be determined.

Note: Even when the system, devices, and cable support CSEL, using jumpers on the hard drive(s) for Master/Slave protocol still works.

Single Hard Drive Installations

To install your new WD hard drive as the only hard drive in your system, use jumpers as shown in Figure 3.

Cable Select Installations: Connect the hard drive to the black connector at the end of the IDE interface cable.

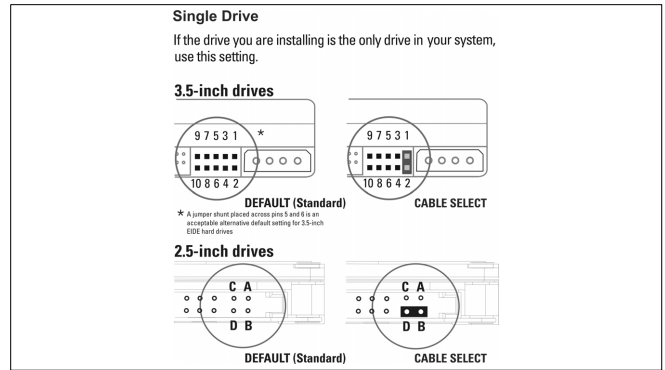


Figure 3. EIDE Single Hard Drive Jumper Settings

Dual Hard Drive Installations

To install your new WD EIDE hard drive with an existing hard drive or CD-ROM on the same interface cable, be sure all drives are jumpered as shown in Figure 4.

Note: Not all hard drive manufacturers use the same jumper configurations. To install a new WD hard drive on the same interface cable with a non-WD hard drive, obtain jumper setting information from the manufacturer of the non-WD hard drive.

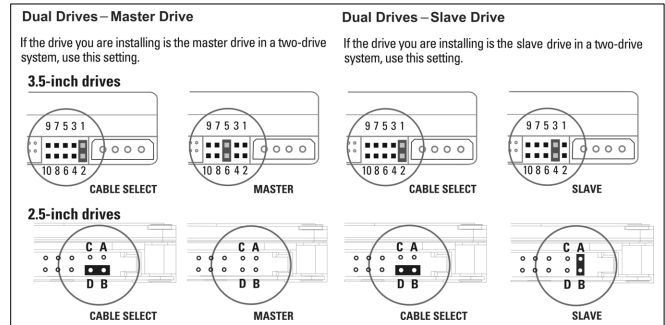


Figure 4. EIDE Dual Hard Drive Jumper Settings

Cable Select Installations: connect the intended boot drive (the first hard drive to be detected) to the black or end connector of the IDE interface cable. Connect the storage drive (the second hard drive to be detected) to the gray or middle connector of the IDE interface cable.

Master/Slave Installations: to install your new WD hard drive with an existing drive on separate IDE interface cables, leave the jumper(s) in default positions for possible future use. The system recognizes each drive as a single, stand-alone drive. Master/slave jumper settings are used only when there are two devices on the same IDE interface cable.

Reduced Power Spinup (RPS)[™] Mode

Implementation of RPS requires a jumper on the 4-pin jumper block of a WD 2.5-inch EIDE drive. To configure the drive for RPS mode, place a jumper shunt on pins B–C as shown in Figure 5. A 2.54 mm mini jumper shunt (low profile) is required.

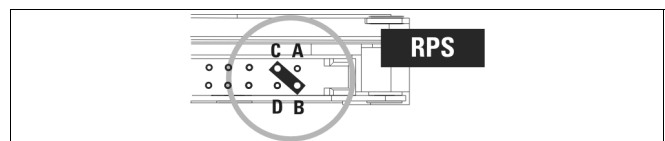


Figure 5. EIDE Reduced Power Spinup (RPS) Jumper Setting

Alternate Jumper Settings (EIDE Drives—Windows® 98/98SE/Me)

Important: Alternate jumper settings DO NOT work with Windows NT/2000/XP, Novell® NetWare®, or UNIX® systems.

Hard drive capacities continue to increase at a phenomenal rate. As a result, some legacy computer BIOSs have compatibility issues with large capacity hard drives. A system BIOS displays this limitation in the following situations:

- The operating system shows a much smaller drive capacity than the actual drive capacity.
- The computer system locks up on initial boot, preventing access to the CMOS setup.

Four capacity points are identified as BIOS barriers that may cause a system BIOS to lock up on initial boot: 2.1 GB, 8.4 GB, 32 GB, and 137 GB. Alternate jumper settings are provided on WD hard drives to overcome system BIOS limitations. These jumper settings cause the drive to report a smaller capacity to work around BIOS limitations.

CAUTION: Use the jumper settings in Figure 6 only if you encounter the specific BIOS limitation (system locks up) described in this section. These jumper settings cause the drive to report 4092 cylinders (2.1 GB) rather than the actual drive capacity. If you use these jumper settings, you **MUST** use Data Lifeguard Tools™ to partition and format your hard drive to access the full capacity of your new drive.

System Locks Up on Initial Boot

If you cannot access the CMOS setup because your system locks up on initial boot, follow these steps:

1. Turn off your system power and check the IDE interface cable and power supply cable.
2. Check jumper settings (see Figures 3 and 4).
3. Turn on your system power.
4. Try to enter your CMOS setup and set the drive type to **auto config**.

If your system still does not respond, your system BIOS may not support drives with more than 4095 cylinders. If this is the case, consider the following solutions:

- Use **Data Lifeguard Tools** to partition and format your hard drive to access the full capacity of the drive.
- Upgrade your system BIOS to support the full capacity of your hard drive.
- Install an **EIDE controller card with an onboard BIOS** that supports hard drives larger than 2.1 GB. For 8.4 GB or larger hard drives, the EIDE controller card must support extended BIOS functions.
- **Rejumper the hard drive** as shown in Figure 6 and install Data Lifeguard Tools which **MUST** be used with these alternate jumper settings. If you move this hard drive to another system, you must replace the jumper in the standard position.

Note for Windows NT Users: If your system locks up, do not use these alternate jumper settings. Use the standard jumper settings

and select a user defined drive type in CMOS setup or upgrade your system BIOS to support the full capacity of your new hard drive.

Important: CSEL jumper settings cannot be used when alternate jumpers are selected. Use the jumper settings illustrated in Figure 3 or 4 for CSEL. Alternate jumper settings are not intended for systems other than Windows 98/98SE/Me.

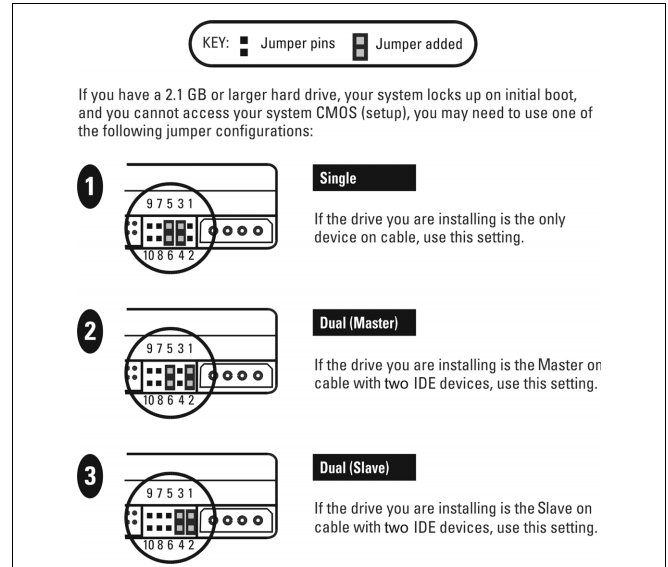


Figure 6. Alternate Jumper Settings for Hard Drives

Apple Installations and Jumper Settings

Some Power Mac® G3 and all Power Mac G4 computers support the Master/Slave configuration. If your system does not support the Master/Slave configuration, you are limited to installing one IDE device per channel (and a maximum of two IDE devices).

You can install two IDE devices on the same cable with the Master/Slave configuration on the following Apple Computers:

- Power Mac G4 and higher
- Power Mac G3 (blue and white, some configurations)
- Power Mac G3 All-in-One

A Power Mac G3 with a U-shaped mounting bracket installed in the rear drive bay is capable of supporting multiple IDE devices. For more information on determining the capability of your Power Mac G3, see Technical Article 24342, *Power Macintosh G3 and G4: IDE Master and Slave Support and Configuration*, at www.apple.com/support.