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Termination Basics

Why terminate?
A basic principle of SCSI says that a SCSI bus requires correct electrical termination at both ends in order to function properly. Unfortunately, termination is implemented differently from SCSI device to SCSI device (some use jumpers, some use removable resistor packs, others use combinations of the two), and this can cause some headaches when configuring multiple devices on a SCSI bus.

Where do you terminate the bus?
Termination must be present at two and only two positions on the SCSI bus, at the beginning of the bus, and at the end, and must occur within four inches of the physical ends of the SCSI bus. Often, the host will be installed at one end of the bus and will provide one of the two terminations required.

When do you terminate the bus?
Whenever you want the SCSI bus to operate reliably! Proper termination ensures that the signal traveling down the SCSI bus doesn't "reflect back", a situation that can cause a variety of problems including "ghosted" SCSI devices, data errors, and other anomalies.

How are terminators powered?
Terminators are powered from the "Term Power" line on the SCSI bus. Term Power can come from any device on the bus, and is provided by either the host, a drive on the bus, the drive enclosure backplane, or any combination thereof. Term Power is provided through a diode and fuse. The drop across the diode and cable allows for a Term Power range of 4.0 to 5.25 volts.

What kinds of terminators are available?
Internal:

Pre-LVD SCSI drives had passive terminators installed in the drive, and could be enabled/disabled by setting a jumper. Drives with LVD interface do not have this on-board termination.

External:

In-line terminators connect in series with the SCSI device, either by plugging into a device connector, or by crimping directly onto the SCSI cable.

Passive:

Primarily associated with SCSI 1, passive terminators are called "Passive" since they don't do any active work to regulate power for termination. They simply use resistors to provide impedance close to that of the cable and rely on the interface card to provide steady power.

Active:

Providing a more advanced form of termination, usually associated with SCSI 2 and SCSI 3, "Active" terminators control the impedance at the end of the

SCSI bus by incorporating voltage regulators or diodes to maintain proper voltage, in addition to resistors and capacitors to eliminate reflections at the end of the bus.

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