



hp SCSI multimode cables



performance

With today's computer systems demanding faster transfer rates, Low Voltage Differential (LVD) technology offers the most advantageous and cost-effective performance cabling solutions. Not only will LVD fulfill the need for speed, it will do so with seamless backward and forward compatibility. The robust LVD design significantly enhances SCSI I/O performance, power consumption, data integrity, and device connectivity. Multimode cables can operate in either low voltage differential, high voltage differential (HVD) or single-ended (SE) modes of operation.

- higher speed: accommodates speeds of 160 Mb/second in 16-bit data mode while lowering power consumption, will expand to 320 Mb/second and to 640 Mb/second in the future
- increased device connectivity: LVD SCSI can connect up to 16 devices
- backward and forward compatible: LVD SCSI is compatible with previous generation devices to provide investment protection and can be seamlessly integrated into new SCSI environments
- interoperable: capable of supporting mixed speed, cross-generational implementations
- reduces exposure to data corruption due to noise, crosstalk, and EMI: LVD differential signals are immune to common mode noise, which is the primary source of system noise; reflections from transmission path impedance discontinuities are less of a problem resulting in decreased crosstalk problems

SCSI (Small Computer System Interface) has a long and proven history in the computing industry. Since SCSI became an industry standard, the interface has evolved to keep pace with the demands of the most sophisticated systems. The data path has been widened and transfer speeds have been increased to keep pace with system requirements. SCSI is preferred where performance is critical.

HP SCSI Multimode cables are compatible with any server or mass storage device. HP SCSI Multimode cables are:

- designed and tested to specifically connect your Hewlett-Packard computing devices, insuring 100% compatibility
- designed to stringent specifications.
- highest quality cable assemblies for your system.

quality and compatibility

- HP designs and tests all cables to meet and exceed industry standards specifications
- meets ANSI/EIA/TIA standards
- superb 360 degree shielding to reduce data corruption from radiated emissions, electromagnetic interference (EMI) and electrostatic discharge (ESD)
- specific mapping of pins within the cable to reduce cross-talk
- each cable internally contains 34 individual twisted pair cables
- contains strain relief to withstand breakage and cable damage
- features thumbscrews for secure connections
- multimode cables have the ability to be used with either SE, HVD or LVD devices

Hp advantage

- guaranteed compatibility with your HP computing equipment
 - reduce down time
- maximize investment by utilizing your existing equipment and accommodates device upgrades
- price performance
 - highest quality cables for a reasonable price

ordering considerations

There are a couple of items that have to be taken into consideration when specifying your SCSI cable order.

Connector style: Check the connector type on the both devices you intend to connect. Make sure that the connector styles on both ends of the cable match the connector styles on the devices you want to connect.

Mode of operation: Since its introduction in the 1980's, the speed and amount of data that can be transferred over a SCSI data cable has also evolved. Verify that the Mode of Operation for the devices are compatible. Multimode cables will operate in LVD, HVD or SE signaling. However, HVD devices cannot operate on the same bus as LVD or SE devices.

The most common acronyms for the generations of SCSI technology as well as the maximum bus lengths and maximum number of devices supported under the standard are listed below.

common acronym	bus width	mode of operation	speed	max clock speed	SCSI architecture	max transfer rate	max bus length	max number of devices
NSE	Narrow	SE	Normal	5 MHz	SCSI-1	5 MB/s	6	8
NSE or FSE	Narrow	SE	Fast	10 MHz	SCSI-2	10 MB/s	3	8
FND	Narrow	HVD	Fast	10 MHz	SCSI-2	10 MB/s	25	8
WSE	Wide	SE	Fast	10 MHz	SCSI-2	20 MB/s	3	16
FWD	Wide	HVD	Fast	10 MHz	SCSI-2	20 MB/s	25	16
UWSE	Wide	SE	Ultra	20 MHz	SCSI-2	40 MB/s	1.5/3	8/4
UWD	Wide	HVD	Ultra	20 MHz	SCSI-2	40 MB/s	25	16
U2D	Wide	LVD	Ultra2	20 MHz	SCSI-2	80 MB/s	12	8
U2WD	Wide	LVD	Ultra2	40 MHz	SCSI-2	80 MB/s	12	16
U3	Wide	LVD	Ultra3	80 MHz	SCSI-3	160 MB/s	12	16

Note: SE=single-ended, HVD=high voltage differential, LVD=low voltage differential, NSE=narrow single-ended, FSE=fast single-ended, FND=fast narrow differential, WSE=wide single-ended

In choosing a cable, be aware that LVD SCSI supports a total bus length of 12 meters. Be sure to include the internal device and external SCSI cable lengths in the overall SCSI bus length calculation.

technical specifications

	differential	single-ended
Conductor Material	• 30 AWG 7/38 tin Plated Copper	• 30 AWG 7/38 tin Plated Copper
Diameter	• .385 + .01 Inches	• .385 + .01 Inches
Mutual Capacitance	• 14 pF/ft Maximum at 100 MHz and 1 MHz	• 20 pF/ft Maximum at 100 MHz and 1 MHz
Characteristic Impedance	• 125 ohms ± 10%	• 90 ohms ± 6%
Number of conductors	• 68	• 68
Time Delay	• 1.5 ns/ft Maximum	• 1.5 ns/ft Maximum
Time Delay Skew	• .025 ns/ft Maximum	• .025 ns/ft Maximum
Attenuation	<ul style="list-style-type: none"> • .022dB/ft Nominal@ 5 MHz • .031dB/ft Nominal@ 10 MHz • .044dB/ft Nominal@ 20 MHz • .063dB/ft Nominal@ 40 MHz • .090dB/ft Nominal@ 80 MHz • .129dB/ft Nominal@ 160 MHz • .180dB/ft Nominal@ 100 MHz 	<ul style="list-style-type: none"> • .021dB/ft Nominal@ 5 MHz • .033dB/ft Nominal@ 10 MHz • .050dB/ft Nominal@ 20 MHz
Near-End Crosstalk	• 3% Maximum	• 3% Maximum
Dielectric Withstand	• 500 Volts DC for 3 seconds	• 500 Volts DC for 3 seconds
Conductor DC Resistance	• .10 Ohms/ft at 20 degrees C	• .10 Ohms/ft at 20 degrees C
Supported Distance	• 12 meters	• 6 meters
Maximum Transfer Speed	• Up to 160 Mhz	• 20 Mhz

products

product number	technology	connector	gender	length
C2978B SCSI Cable	LVD, HVD or SE (Multimd)	HDTS68	M/M	.5m
C2911C SCSI Cable	LVD, HVD or SE (Multimd)	HDTS68	M/M	1m
C2979B SCSI Cable	LVD, HVD or SE (Multimd)	HDTS68	M/M	1.5m
C2924C SCSI Cable	LVD, HVD or SE (Multimd)	HDTS68	M/M	2.5m
C7521A SCSI Cable	LVD, HVD or SE (Multimd)	HDTS68	M/M	5m
C7522A SCSI Cable	LVD, HVD or SE (Multimd)	HDTS68	M/M	10m
C7532A SCSI Cable	LVD, HVD or SE (Multimd)	HDTS68	M/M	20m
C2361B SCSI Cable	LVD, HVD or SE (Multimd)	VHDS68/HDTS68	M/M Adptr	1m
C2362B SCSI Cable	LVD, HVD or SE (Multimd)	VHDS68/HDTS68	M/M Adptr	2.5m
C2365B SCSI Cable	LVD, HVD or SE (Multimd)	VHDS68/HDTS68	M/M Adptr	5m
C2363B SCSI Cable	LVD, HVD or SE (Multimd)	VHDS68/HDTS68	M/M Adptr	10m
C2371A SCSI Cable	LVD, HVD or SE (Multimd)	VHDS68	M/M	.5m
C2372A SCSI Cable	LVD, HVD or SE (Multimd)	VHDS68	M/M	1m
C2373A SCSI Cable	LVD, HVD or SE (Multimd)	VHDS68	M/M	2m
C2374A SCSI Cable	LVD, HVD or SE (Multimd)	VHDS68	M/M	5m
C2375A SCSI Cable	LVD, HVD or SE (Multimd)	VHDS68	M/M	10m

Special in-line terminated cables needed for High Availability or ServiceGuard solutions can be found on the HP In-line terminated cable datasheet.

Connector style Terms: BL = bail lock, TS = thumb screw, M = Male, F = Female, 50 = 50 pin, 68 = 68 pin, HD = high density, VHD = very high density

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