



Making SCSI Work™

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SCSI Expander Model MM16

Getting the Most from LVD/MSE SCSI

- Extend Bus Length
- Up to 160 MByte/sec sustained throughput
- Convert Between LVD and Single-ended
- Isolate Segments of a SCSI bus
- Targets and initiators may be located on both the A and B sides of the Expander
- Backward compatible with older versions of SCSI
- Does not consume a SCSI ID
- The board-level version **Model MM17** is sized to fit in a standard 3.5" drive bay.



The stand-alone Model MM16 includes a desktop power supply for line voltage operation.

SCSI Multimode Expander Extends the SCSI Bus Length of an LVD/MSE System

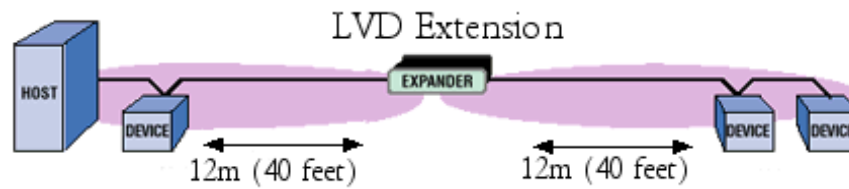


Expand the functionality of LVD/MSE SCSI in several ways: 1) conversion from LVD to SE or vice versa, 2) extending the SE or LVD SCSI bus length, 3) isolating one SCSI segment from another SCSI segment, and 4) join SCSI segments. All this is accomplished without any impact on SCSI protocol or data throughput by using **Paralan's Models MM16 / MM17**.

Extending the Bus Length

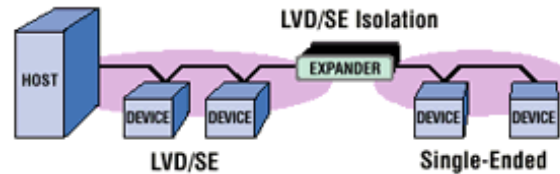
There are several ways to utilize Expanders to extend the SCSI bus length well past standard SCSI limits. Some examples:

Using a single Multimode Expander – The effective bus length can be doubled by the addition of a single Multimode Expander. With all LVD devices, the standard 12m (40 ft) bus length can be extended to 24m (80 feet).



Maximizing Thruput with Mixed Devices

Multimode LVD SCSI will automatically change to Single-Ended (SE) if an SE device is on the bus segment. When both LVD and SE devices share the same bus segment, the entire SCSI bus segment will operate at the lower performance level of single-ended SCSI, including reduced bus length. However, by grouping LVD and SE devices, and isolating them with a Multimode Expander, the LVD devices can be operated at their full designed thruput levels.



Using Two Multimode Expanders in a Back-to-Back Connection

Contact Paralan [Technical Support](#) for information.

When Used to Extend the SCSI Bus

Cable causes timing delays of approximately 1.5 ns per foot of length. When SCSI-specified cable length is exceeded, this cable-caused delay would normally cause a system to malfunction. Logic circuitry in the Expander manages this delay such that disconnect, reconnect, arbitration and all other SCSI features are not affected. The SCSI signals are regenerated, reshaped, and retransmitted, all transparent to the system.

Paralan Expanders are completely compatible with all devices that conform to the full ANSI X3T10 standard. They are available either as stand-alone units utilizing wall power, or as board-level units for installation in other equipment.

Isolation for Hot Swapping

The logical isolation between the two sides of an Expander allows a device on side B, for example, to be disconnected without disturbing side A.

Narrow/Wide Conversion

The MM16 and MM17 (wide) models may be used to interconnect narrow SCSI devices on side B, for example with wide SCSI on side A.

Differential (IVD and HVD) SCSI Extenders and Converters

Paralan also has Converters (Paralan MHxx models) for converting between High Voltage Differential (HVD) and LVD or single-ended SCSI devices. Converters may also be used to provide extension of an LVD or single-ended bus up to 50m (160 feet). To extend an existing HVD bus, see the data sheet for Paralan's [SIR-D16 RegeneratoR™](#).

[PDF version](#) of this data sheet.

Specifications For MM16/17 SCSI Multimode Expander:

Environmental

0 - 95% non-condensing
 Operating Temperature: 0 - 50°C
 Storage Temperature: -25 to +75°C

Power Requirements

Stand-alone units (MM16):
 Voltage: 115/220 V ac, auto select
 Frequency: 50 - 60 Hz
 Board-level units (MM17):
 Voltage: 5 V dc ±5%
 1.5 A max

Safety Approvals

UL, CSA, TUV, CE

EMI/RFI

FCC Class A, CE

SCSI Connections

MM16, MM17: SCSI-3 68-pin High-Density female Alt-3 "P" Connector

Communication

Sustained Data Throughput:
 Up to 160 MBytes/sec (16-bit)

Warranty

Two year limited warranty

Weight:

MM16: approx. 2 lb (0.9 kg)
 Shipping weight, approx. 4 lb (1.8 kg)
 MM17: 2.5 oz (71 g)
 Shipping weight, approx. 2 lb (1 kg)

Physical Size (MM16)

Height: 1.6 in. (41 mm)
 Width: 4.1 in. (104 mm)
 Depth: 4.5 in. (114 mm)

Board-Level Version Dimensions:

Overall board dimensions 4.00 x 3.88 in. (101.6x98.5 mm)
 See [PDF drawing](#) for details.

Ordering Guide:

Model Numbers		SCSI Product Description
Stand-alone	Board Version	
MM16	MM17	SCSI Wide LVD/MSE to LVD/MSE Expander (16-bit)
EB1		Rack Mount Expander Box (rack mount up to 3 SCSI Expanders)
2811		5-1/4" Half Height Drive Bay Mounting Bracket & Faceplate for MM17
SQxx		SCSI Quiet Cable™ (specify length)

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