LSI LOGIC ®

SYM53C120
SCSI HVD Bus Expander

The SYM53C120 is a single chip solution allowing the extension of device connectivity and/or cable length limits of the SCSI bus. The SYM53C120 operates as a SCSI bus repeater when multiple single-ended to single-ended buses are connected together and as a converter when attaching a single-ended bus to a differential bus. In both modes, the device provides electrical isolation between the two separate SCSI buses. This product works with Symbios® extensive SYM53C7xx and SYM53C8xx family of SCSI products as well as other industry SCSI controllers. An advantage of the SYM53C120 is it does not require any software or consume a SCSI ID allowing for easy integration and maximum bus utilization. Adding the SYM53C120 to a SCSI bus environment creates a low risk solution for applications requiring scalable device connectivity and SCSI bus electrical isolation.

Benefits
- Expands device connectivity and cable distances in certain applications
- Electrically isolates SCSI buses
- Allows for large disk configurations
- Does not consume a SCSI ID or limit system performance
- Completely transparent to the SCSI subsystem

Features
- Accepts <u>any</u> asynchronous or synchronous data transfer rates up to Ultra SCSI
- Targets and initiators can be located on either the SCSI A or B side
- Does not consume a SCSI ID
- Supports two modes of operation:
  - Repeater: Single-ended to Single-ended
  - Converter: Single-ended to Differential with external transceivers
- Connects two wide/narrow SCSI buses
  - Extends Ultra SCSI lengths in certain applications
  - Extends Total Ultra SCSI device support
- Signals between buses are regenerated, reshaped, and transmitted transparently to the SCSI subsystem
- Supports TolerANT® active negation technology
- Complete support for SCSI -1, -2, and -3
- Completely independent of software
- Pin level SCSI bus disable mode
- Packaged in a 128-pin PQFP

The SYM53C120 electrically isolates a SCSI bus into two distinctive segments. It supports both single-ended to single-ended, and single-ended to differential modes (using of external differential transceivers). The A side needs to be connected directly to a single-ended SCSI bus. The B side has the single-ended capable transceivers as well as the individual driver controls for external differential transceivers.

The SYM53C120 provides additional control capability through the pin level SCSI bus disable mode. This feature allows logical disconnection of both the A side bus and B side bus to without disrupting transfers currently in progress. For example, devices on the logically disconnected B side can be swapped out while the A side bus remains active.

As with all of the Symbios SYM53C7xx and SYM53C8xx SCSI products, the SYM53C120 features TolerANT technology. The benefits of TolerANT include increased immunity to noise when the signal is going high, better performance due to balanced duty cycles, and improved SCSI transfer rates.

The following are examples of typical SCSI bus repeater and converter applications for the SYM53C120. Many other configurations are possible and are only limited by the imagination of the system architect.

Scalable Device Connectivity —*This diagram shows how the SYM53C120 could be used to repeat single-ended Ultra SCSI cable distances to maximize device connectivity. This configuration utilizes a 3 meter cable to support up to 16 devices on a single channel host controller.*
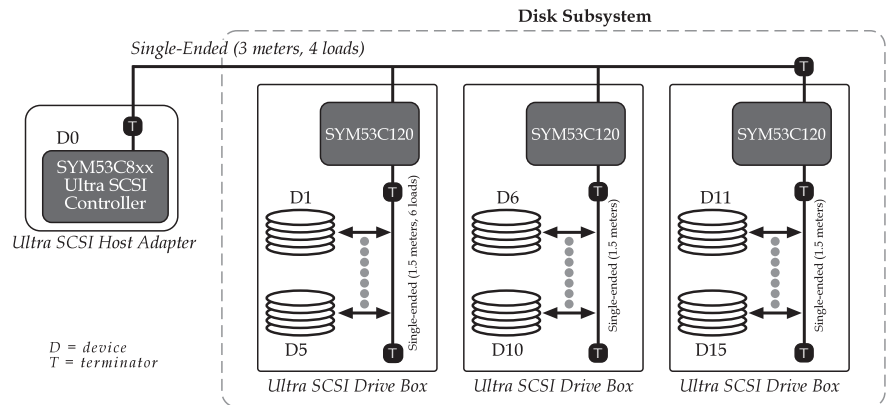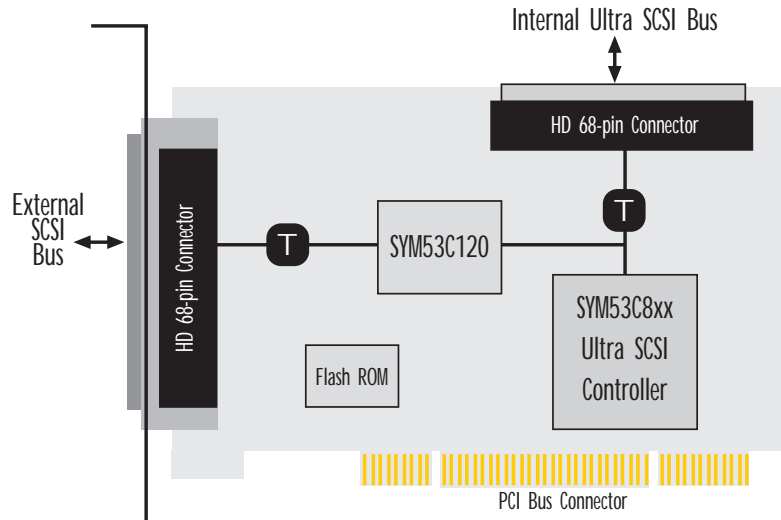

This example employs both SCSI bus repeater and converter applications.This configuration demonstrates remote storage capability and SCSI bus channel redundancy.
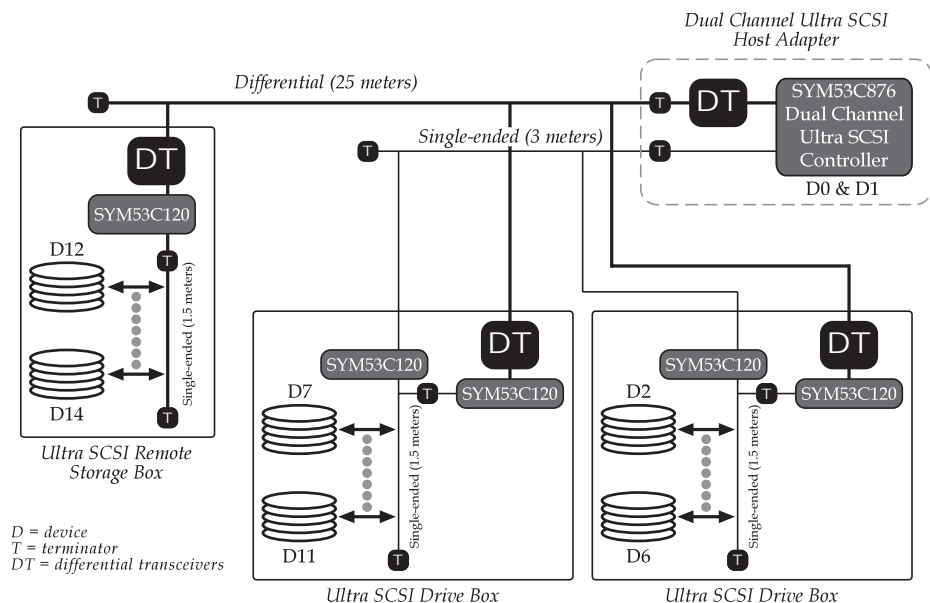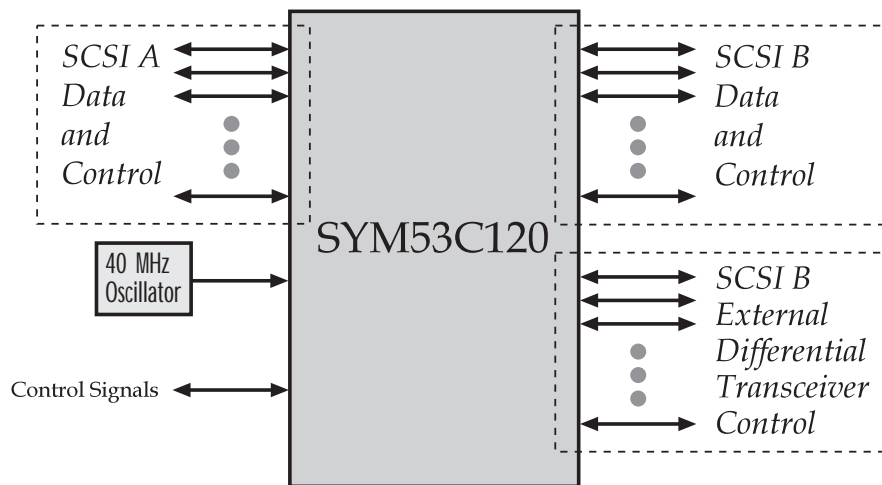
SCSI Bus Electrical Isolation — *This configuration shows how the SYM53C120 could be used to electrically isolate the external SCSI bus from the internal bus. This configuration maintains the integrity of internal SCSI subsystem design yet allows new cables or devices to be added to the external bus. In other words, this application prevents end-user external configurations from affecting the operation of internal devices.*

Internal Ultra SCSI Bus

HD 68-pin Connector

External SCSI Bus

HD 68-pin Connector

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SYM53C120

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SYM53C8xx Ultra SCSI Controller

Flash ROM

PCI Bus Connector

Functional Signal Grouping

SCSI A Data and Control

SCSI B Data and Control

SYM53C120

40 MHz Oscillator

Control Signals

SCSI B External Differential Transceiver Control

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