Inventra™

A Business Unit of Mentor Graphics
1001 Ridder Park Drive
San Jose, CA 95134-2314 USA
URL: www.mentorg.com/inventra

Introduction

Inventra is a leading provider of simulation and core logic macros. Xilinx and Inventra provide a comprehensive Universal Serial Bus (USB) solution. The USB Core logic saves many man months of design and integration time. Software solutions along with simulation models further shorten design schedules.
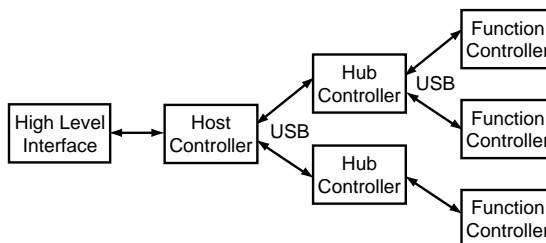
Features

- Complete functionality for USB
    - USB Host Controller
    - USB Hub Controller
    - USB Function Controller
- Complete system simulation capability
- Extensive software library available
- Includes compliance test suite
- Software debug capability
    - Provides user capability to debug system drivers

Functional Description

The USB simulation model provides full system level simulation capability. This includes the ability to generate USB traffic for multiple functions simultaneously, including an unlimited mixture of high- and low-speed devices. The user has the ability to add hubs and support features such as Connect, Disconnect, Suspend and Resume.

Host Controller Model Features

- Provides high level user interface
    - Get Status, Clear Status, Get Descriptor, Set Descriptor, etc.
    - User does not have to generate traffic on frame-by-frame basis
- Multiple traffic streams can be started simultaneously to multiple hubs and or USB functions
- Automatically generates pre-amble for low speed transactions
- USB Host Controller breaks up traffic to match device

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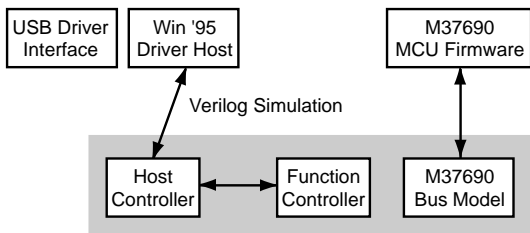**Figure 1: USB Simulation Model**

characteristics
- Large data blocks are automatically broken up to match device requirements
- User can easily transfer large data files with one simple command
- Error Generation
    - User can generate any error from the USB Host Controller
- Automatic Retry on data Errors

HUB Function Model Features

- Connectivity Behavior
- Device Connect / Disconnect detection
- Bus fault detection and recovery
- Full / low speed device support

Function (Device) Controller Model Features

- Supported Function Controller features
    - Multiple End Points
    - Interrupt
    - Control
    - Isochronous Device
    - Bulk Device
- Multiple Device Emulation
- Error Generation Capabilities
    - CRC Errors
    - Data Retries
    - Response Time out
    - ID error
- Complete Device Configuration
- Supports all device commands
- Full speed / Low Speed Functions

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Figure 2: USB Model with Hardware/Software Co-Design

- Multiple Functions can be instantiated
- User Friendly Interface
- Complete Device Emulation Capability
- User Interface option
  - Verilog
  - "C" interface

Related Information

Xilinx Programmable Logic

For information on Xilinx programmable logic or development system software, contact your local Xilinx sales office, or:

Xilinx, Inc.
2100 Logic Drive
San Jose, CA 95124
Phone: +1 408-559-7778
Fax: +1 408-559-7114
URL: www.xilinx.com

For general Xilinx literature, contact:

Phone: +1 800-231-3386 (inside the US)
              +1 408-879-5017 (outside the US)
E-mail: literature@xilinx.com

For AllianceCORE[TM] specific information, contact:

Phone: +1 408-879-5381
E-mail: alliancecore@xilinx.com
URL: www.xilinx.com/products/logicore/alliance/
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