

USB Simulation Model

February 1997

Product Description 1.0

Introduction

Inventra/CAE is a leading provider of simulation and core logic macros. Xilinx and Inventra/CAE provide a comprehensive Universal Serial Bus (USB) solution. The USB Core logic (Macro) saves the customer 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

Full System Level Simulation Capability

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.

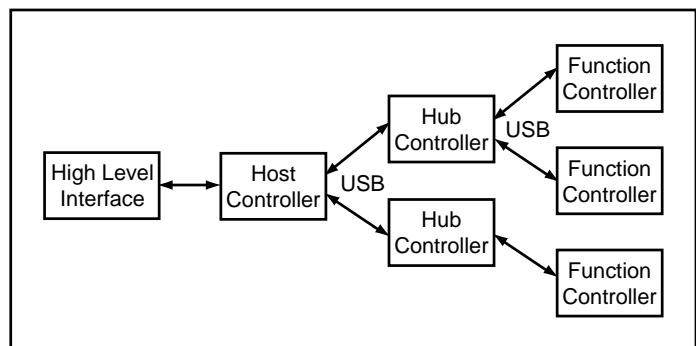


Figure 1. USB Simulation Model.

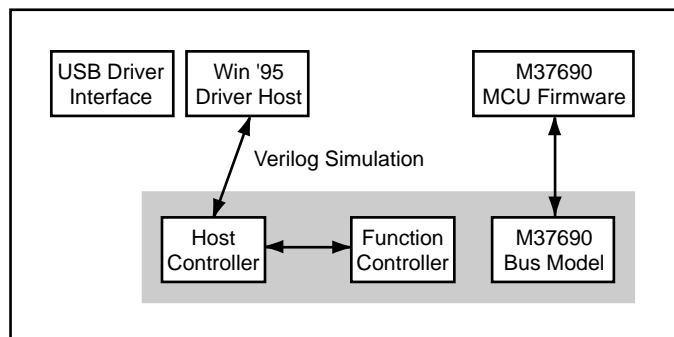


Figure 2. USB Model with Hardware/Software Co-Design.

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

Additional Available Products

Inventra/CAE supplies a complete line of hardware and software products for USB system development. Contact Inventra/CAE for more information.

USB Cores

Inventra/CAE offers USB host, hub and function controller cores that have been optimized for Xilinx FPGAs.

Ordering Information

CAE Technology is now part of the Inventra™ business unit of Mentor Graphics Corporation Company. To purchase or make further inquiries about this or other Inventra/CAE products, contact your local Mentor Graphics sales representative, or Inventra/CAE directly:

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San Jose, CA 95131-2314 USA
Phone: 888-CAE-TECH (inside the US)
408-451-5860 (outside the US)
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E-mail: info@caetech.com
URL: www.caetech.com

Related Documentation and 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: 408-559-7778
Fax: 408-559-7114
URL: www.xilinx.com

For general Xilinx literature, contact:

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

For AllianceCORE™ specific information, contact:

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