



Product Brief

MCCI Catena[®] 1910 USB 2.0 HSIC Tester

High Speed InterChip USB

In 2007, the USB standard was expanded to allow product developers to use USB as a high speed chip-to-chip interface. This method of short range (under 10 cm) interchip connectivity leverages the existing USB infrastructure to reduce development time and cost. HSIC USB minimizes cost and saves power with a simple two wire interface. It operates at low-voltage CMOS levels, replacing the traditional USB PHY.

The Challenge – How to Test?

Today’s USB bus analyzers are powerful tools. However, these analyzers currently only support tracing via standard USB cables and connectors. Because HSIC USB uses different electrical signaling and doesn’t use a standard USB connector, traditional bus analyzers cannot be used for debugging HSIC USB products. Developers of silicon or platforms using HSIC USB need a reliable, high performing tester to ensure product time-to-market.

MCCI Catena 1910

To fill this gap for HSIC USB product developers, MCCI has developed the Catena 1910 USB 2.0 HSIC Tester. The system, which can operate in host emulation or protocol analyzer mode, consists of an ExpressCard adapter, an intelligent test box, and an HSIC probe (see the diagram on p.2). These modes may be operated individually or as a combined system. HSIC USB device mode will be available in 3Q2010.

Synopsys DesignWare Hi-Speed USB 2.0 On-The-Go IP in FPGA operates as the HSIC host, seeing the Unit Under Test (UUT) as an HSIC device. The integrated hardware design captures USB transaction-level traffic at the highest possible PCIe transfer rate.

During data acquisition, triggering can be done manually by the operator or automatically, as defined by parameters set in the PC-based control software. Captured data is formatted such that it can be exported for viewing with Ellisys Visual USB analyzer software.

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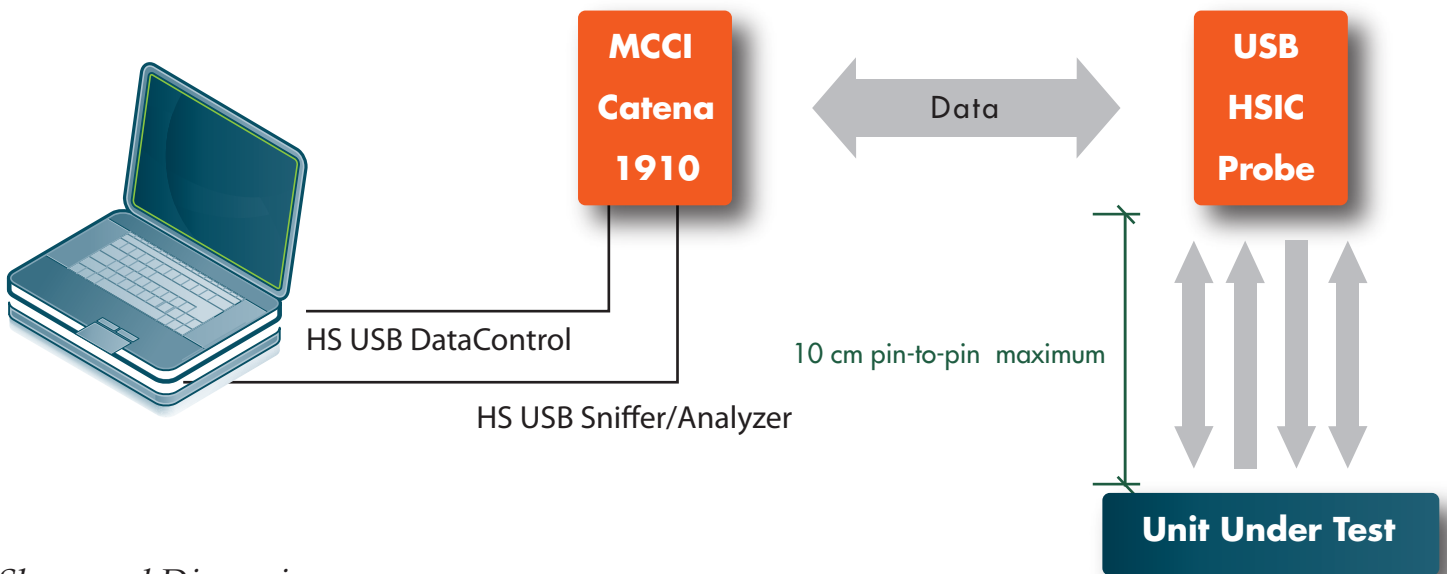
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Summary of System Hardware Components

- ExpressCard - Connected to Catena via PCIe interface cable, plugs into PC.
- Catena 1910 - The main test unit.
- Probe card - HSIC probe card to attach to the unit under test.
- Optional cable - to attach probe to unit under test.
- Host PC (Not included) - A PC running Windows XP with an ExpressCard slot (laptop or desktop with ExpressCard adapter board).
- Unit under test (Not included) - The unit that is to be tested via the Catena.

MCCI Catena 1910 System



Shape and Dimension

- The Tester box is 226x165x41 mm.
- The PCIe Interface cable is round and 4 meters in length
- The Samtec Probe to Tester interface cable is a 1 meter dual ribbon cable
- The Probe card is 76x76mm with a 25x38mm extension
- The optional Probe to UUT cable is 70.4 mm in length with a female receptacle at one end and a male plug at the other end

Software

The MCCI Catena 1910 system comprises three major software components:

- The drivers, including the Catena 1910 PCIe driver and the MCCI HUB driver
- The `hsicana.exe` data acquisition application, which captures and records HSIC traffic in a format compatible with the Ellisys Visual USB Analysis software
- The client library: a library and header suitable for use in the creation of custom applications

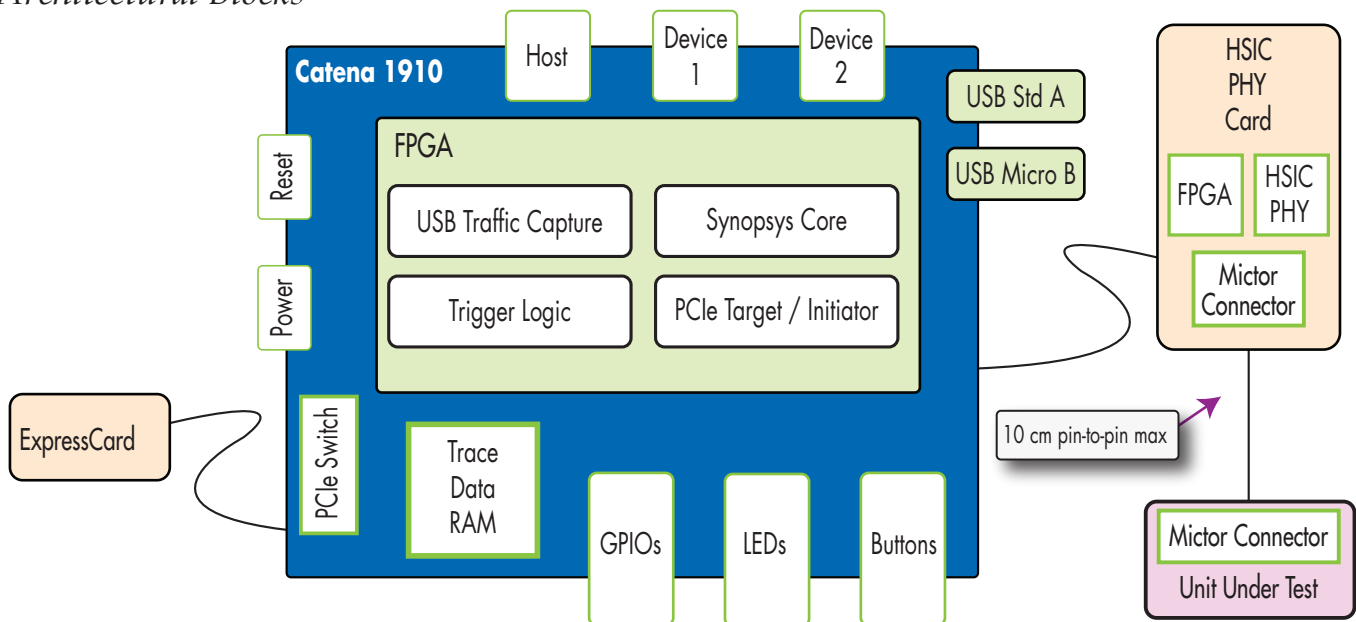
UUT Interface Connector

The MCCI Catena 1910 Probe module uses a plug style, 38 pin Mictor connector for connecting to the UUT. Thus the UUT must have a receptacle-style 38-pin Mictor connector (Amp part number 2-5767004-2) that mates with the plug on the Probe module.

MCCI HSIC Tester Features

- HSIC USB using Synopsys USB HS OTG IP
 - Scatter/Gather DMA support
 - PIO transfer
- Host mode
 - Up to 16 concurrent active pipes
- Data capture mode
- External trigger supported
- Trigger — manual or on programmable condition
- GPIO control
- HSIC USB devices mapped to Windows USB device drivers using normal Windows APIs. All device features can be supported up to a limit of 16 concurrently active endpoints
- Simple command-line interface
- With suitable class drivers from Microsoft, MCCI, or third parties, USB endpoints can be mapped to virtual UARTs
- Rich Application Programming Interface
- SMSC's USB4640 HSIC Hub as reference device
- Push-button activation of LPM and L2 suspend/resume
- Configurable voltage
- Overvoltage protection
- Manual re-enumeration (via push-button)
- Field upgradable

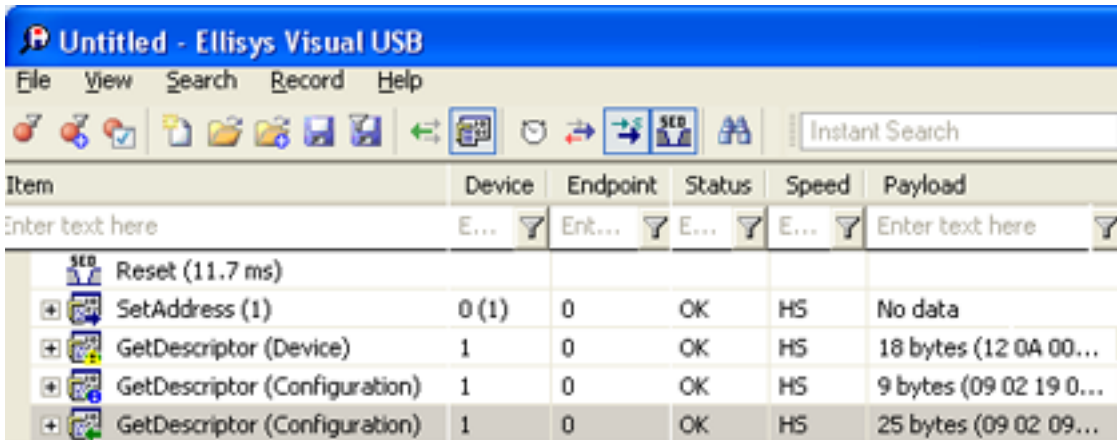
Architectural Blocks



Ellisys Visual USB

Data captured with the MCCI Catena 1910 is viewable with the Ellisys Visual USB analysis software.

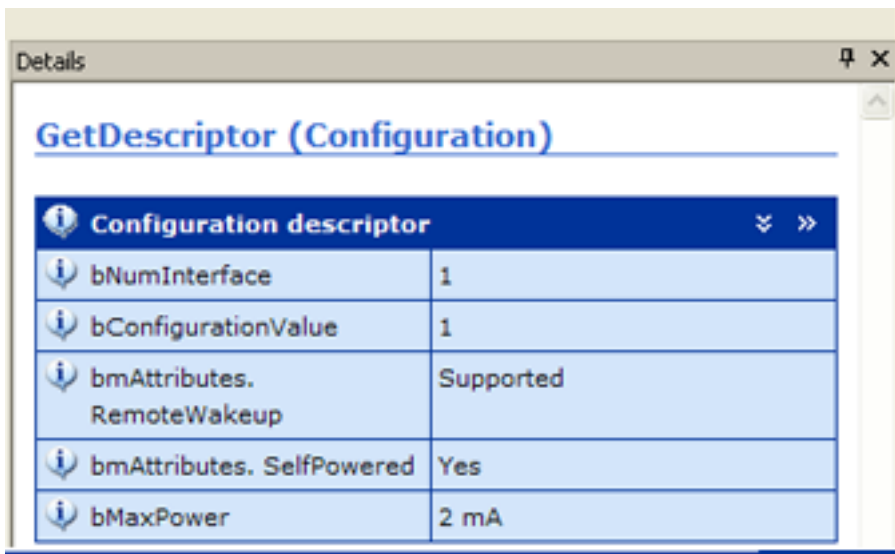
Here is an excerpt of the Ellisys screen, showing that the user has selected the “GetDescriptor (Configuration)” command:



The screenshot shows the main window of Ellisys Visual USB. The title bar reads "Untitled - Ellisys Visual USB". The menu bar includes "File", "View", "Search", "Record", and "Help". Below the menu bar is a toolbar with various icons and an "Instant Search" input field. The main area is a table with columns: "Item", "Device", "Endpoint", "Status", "Speed", and "Payload". The table contains the following data:

Item	Device	Endpoint	Status	Speed	Payload
Reset (11.7 ms)					
SetAddress (1)	0 (1)	0	OK	HS	No data
GetDescriptor (Device)	1	0	OK	HS	18 bytes (12 0A 00...
GetDescriptor (Configuration)	1	0	OK	HS	9 bytes (09 02 19 0...
GetDescriptor (Configuration)	1	0	OK	HS	25 bytes (09 02 09...

The Ellisys software allows the user to get configuration, interface, and endpoint details about the selected command. Here is an excerpt of the configuration details for the selected command:



The screenshot shows the "Details" window for the selected "GetDescriptor (Configuration)" command. The window title is "Details". The main heading is "GetDescriptor (Configuration)". Below this is a table titled "Configuration descriptor" with the following data:

Configuration descriptor	
bNumInterface	1
bConfigurationValue	1
bmAttributes. RemoteWakeup	Supported
bmAttributes. SelfPowered	Yes
bMaxPower	2 mA

Ellisys is a Test and Measurement company committed to the design and timely introduction of advanced protocol analysis solutions for USB devices. Developers have been using Ellisys USB products and solutions with great success.

