1394b PHY IP Core
PHY Layer IP Core for 1394b

Applications

Vehicle System - Remote Node

Vehicle System - Vehicle Management Computer

Avionic Mission Systems

Benefits

Increase interface port density while lowering size and power

Additional diagnostics and programmable operation features

Leverage proven technology for standard interface implementation

Features

AS5643 compliant interface

Supports S100/S200/S400 data rates

Configurable number of ports per PHY instantiation

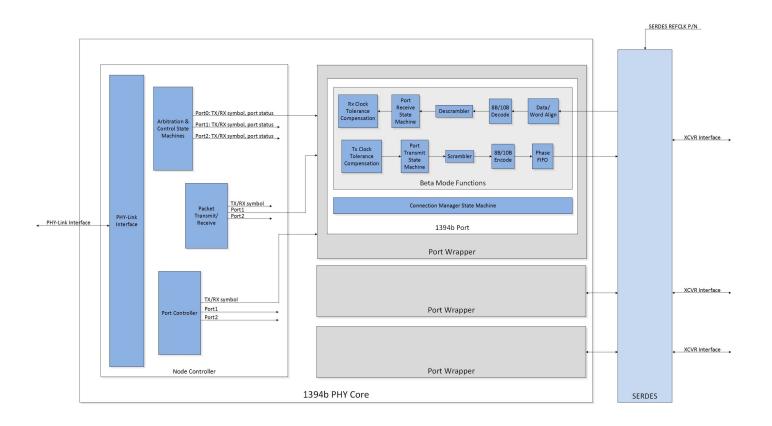Configurable number of PHYs in a single FPGA

Standard PHY-Link interface Mil1394 targeted PHY layer implementation

Overview

The New Wave Design and Verification (New Wave DV) 1394b PHY core provides a complete Mil1394-targeted solution for the PHY layer of the 1394b protocol. The core includes all functionality needed to meet Mil1394 market requirements including: comma alignment, 8b/10b encode/decode, primitive decode, scrambling, port state machine, connection manager, arbitration controller, elastic FIFO, and phase FIFO.

At the physical layer, the core is built for connecting to FPGA/ASIC embedded SERDES, discrete SERDES parts, or general purpose IO. The Link Layer interface of the core provides the industry standard PHY-Link interface. This PHY-Link interface connects directly to Link Layer IP cores from New Wave DV, to discrete Link Layer integrated circuits, or to custom logic developed by the end user.

This core is targeted towards Mil1394 aerospace and defense applications and has been used on a wide range of FPGA devices at varying operating rates. The core comes with test-benches and example code, making design integration a straightforward task.

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Functional Description

The 1394b PHY IP Core was developed as a Mil1394 (1394b-AS5643) compliant IP-based replacement to existing discrete 1394b PHY integrated circuits. The IP Core implementation provides significant operational benefits including size, weight, and power savings over legacy discrete component implementations.

Use of an IP Core-based implementation for 1394b also significantly mitigates future obsolescence issues. Discrete component 1394b options are now offered by only one vendor. Since the PHY Core from New Wave DV can operate in all FPGA technologies including but not limited to AMD (Xilinx), Intel (Altera), and Microchip (Microsemi); future implementation options are assured.

In the PHY Core, New Wave DV provides diagnostic and operating capabilities that are not available in the 1394b discrete components. These additional capabilities include diagnostic information, shortened toning times, fixed topology configurations, reset storm prevention, and hardware-based AS5643 STOF offload.

The PHY core can be instantiated multiple times in a single part. The PHY core also has a configurable number of nodes per PHY instantiation. Customers have taken advantage of this capability to build implementations up to 15 nodes with port counts of 1, 2, or 3. This customization allows for the most efficient use of FPGA/ASIC resources.

By taking advantage of modern FPGA technology, and using this IP Core along with other New Wave DV Mil1394 Link Layer Cores, it is feasible to implement in one FPGA what used to be implemented in 8 to 10 discrete components. Each of those discrete integrated circuits being the size of the one FPGA/ASIC using the New Wave DV IP cores. This is a board-space savings for high-density 1394b applications of roughly 10:1.

Evaluation versions of the PHY IP Core are available and New Wave DV has a set of standard form factor boards featuring FPGAs, 1394b connectors and transformers, and off-the-shelf reference designs for quick evaluation of the PHY IP core.

Our Commitment

New Wave DV is committed to providing the latest innovations in technology, architectures, and techniques to keep our customers one step ahead of the rest. Our products, complete with the Development Framework, are intended to offer our customers an entirely unique out-of-the-box experience.

Technical Specifications

Core is delivered in netlist format including constraint files

SUPPORTED DEVICES
AMD (Xilinx): Virtex, Kintex, Artix, Zynq FPGAs
Intel (Altera): Stratix, Arria, Cyclone FPGAs
Microchip (Microsemi): SmartFusion2, Igloo2 FPGAs

SUPPORTED RATES
S100/S200/S400

OPERATING FREQUENCIES
S100: 12.288Mhz
S200: 24.576MHz
S400: 49.152MHz

1394b Host Adapter Cards

In addition to the 1394b PHY core, New Wave DV provides standard form factor 1394b PHY interface cards that incorporate the 1394b PHY interface core along with high performance DMA engines and software drivers. Available in PMC/XMC form factors, New Wave DV 1394b and Mil1394 cards provide up to 30 ports in a single card.

Complete Product Support Program

Our customers can attest to our exceptional support. New Wave DV provides an industry-standard warranty on its products, but it is the human factor that makes our support so valuable to our customers. Our team takes the time and effort to ensure a positive customer experience.

Ordering Information

700-FW100-00-xx: 1394b PHY Layer IP Core, S100/S200/S400 rate support

Other product configurations are available. Please contact us.