

ProcSparkIV™

PCIe x4 Computation Accelerator

Key Features

- Cyclone IV E 40 and 115 FPGAs
- 4-lane PCI Express (PCIe x4) host interface
- Three level memory structure (4.5 GB+).
Maximum sustain throughput of **1,100 GB/s** for internal memories and **4 GB/s** for DRAMs as follows:
 - Up to 432 M9K (9K-bit) DPRAM blocks
 - A 512 MB DDR2 memory with **2GB/s** sustain throughput using up to 8 ports. (Up to 16 ports with lower access rate)
 - 1 DDR2 SODIMM with up to **4 GB** at a maximum sustain throughput of **2 GB/s**
- Supports PSDB type 1 Daughter Boards:
Camera Links, SDI, HDMI, DVI, User's Ethernet and other interfaces including user's proprietary interfaces
- Typical system frequencies: 100-150 MHz
- Flexible clocking system
- Volatile and non-volatile design security
- Supported by GiDEL's [ProcDeveloper's Kit](#)

Benefits

- Leading edge performance
- Low cost/ high performance suited for mass production
- Advance development tools
- Low power consumption
- Maintainability
- Reliability
- Long life cycle



Overview

The **ProcSparkIV™** system is an FPGA-based platform founded on Altera's next-generation Cyclone IV devices. Powerful FPGA devices conjoined with GiDEL's innovative architecture and IPs, at an unprecedented cost-performance, makes the **ProcSparkIV** ideal for OEM production requirements. The board's unique architecture is comprised of large multi-level memories, flexible and massive connectivity and a variety of daughter board interface possibilities (SDI, DVI, Camera Link, HDMI, user proprietary, etc.) enabling the user to build complex designs and seamlessly integrate with peripheral I/Os. Abundant memory (512MB on-board + 4GB SODIMM) coupled with fast 4-Lane PCIe connection enable strong co-processing between a standard PC operating system and the FPGA acceleration. The **ProcSparkIV** system, with GiDEL's [ProcDeveloper's Kit](#) and tools, offers incredible performance yet supports quick implementation of your unique design. These unique features are achieved by eliminating the need for a high-speed board design, a PCI Express application driver, board constraints and environment FPGA code. The generated HDL code enables high throughput, easy-to-use parallel access to large memories. As a result, designers can focus on their proprietary value-added design. User designs may be in HDL, C-based, Simulink (graphical design) or any combination of them.

Target Applications

Low cost COTS acquisition and accelerator boards in:

- ✓ Frame grabbing
- ✓ Machine Vision and Imaging
- ✓ High performance acquisition systems
- ✓ Medical Imaging
- ✓ Video Applications
- ✓ Up to 40Gbit/s IO sub-system

Development Environment

The *ProcDeveloper's Kit*, GiDEL's intuitive design and debug environment, facilitates design development effort on the *ProcSparkIV* system. The kit contains:

- ✓ *ProcWizard*TM Development Application
- ✓ *ProcMultiPort*TM and other memory control IPs
- ✓ *ProcHILs*TM option for Hardware In the Loop acceleration
- ✓ *TotalHistory*TM option for virtually unlimited signal tracing

The *ProcWizard* performs hardware initialization and automatically generates the following:

- Interface documentation in HTML or Microsoft Word.

- C++ class(es) application driver(s) enable simultaneous accesses of multiple applications, each to its' dedicated section of the Proc board.
- Top-level designs, interface modules/entities and on-board memory controllers for application use
- Device constraints (as pin-outs).

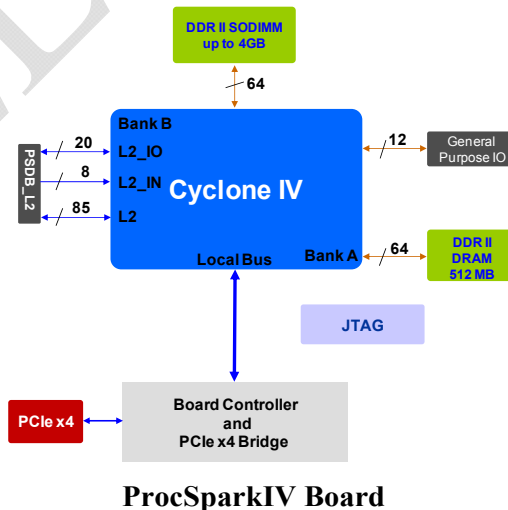
The *ProcMultiPort* and other memory control IPs provides simple access as FIFOs and frame delays to the on-board DRAM. It enables parallel access to the on-board memory while enabling to split the physical memory into multiple logical memories. As a result the main benefits are:

- Simplifies design and enhances system performance.
- Replaces the need for inventory of special memories by using standard memory and IP.

The *USBBlaster* enables visibility of internal signals using the available FPGA memory.

The *ProcHILs*TM enables the users to design in *Simulink*TM while accelerating enormously the design simulation on the *ProcSparkIV* board. Alternatively, the *ProcHILs* may be used, via Simulink, as a design entry tool for an FPGA based accelerator.

Other high-level design entry options, such as C++, are available via GiDEL's partners.



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