HawkEye-CL
Camera Link Acquisition and Image Processing System

Key Features

- Infrastructure for full Vision/Imaging system solutions, including image acquisition, real-time image processing, and post-processing on host.
- Large image acquisition bandwidth of up to 50 Gb/s, enabling support for high-end cameras.
- Option for image processing on FPGA, allowing for real-time processing free of host computer.
- Flexibility to realize any camera interface and protocol for streaming the camera data directly to the FPGA.
- Huge frame buffers of up to 16 GB to enable high-acquisition capacity and to enhance image processing capabilities.
- Ultra-high data offload capability of up to 64 Gb/s, enabling high-resolution post processing on host computer.
- Powerful tools for efficient development of both software and FPGA code.

Target Application Examples

- Automotive and Inspection applications demanding real-time analysis and system response.
- Military & Aerospace applications combining real-time and post-acquisition analysis.
- Medical & Scientific applications requiring high-resolution imaging capabilities.
- Traffic & Transportation applications processing high-volume data from multiple locations.

The Gidel HawkEye-CL frame grabbing and real-time image processing system provides the core infrastructure required to support the most demanding Vision and Imaging applications.

The HawkEye series offers a number of options to accommodate diverse application needs, from plug-and-play high-performance frame grabbers to a full system solution that comprises acquisition, open-FPGA image processing, and a flexible custom camera interface. Off-the-shelf HawkEye solutions include support for Camera Link and CoaXPress cameras.

The HawkEye-CL is Camera Link Rev. 2.0 compliant and supports 80-bit Camera Link modes, including 10-bits/8-tap and 8-bit/10-tap modes. The HawkEye-CL family is based on PCIe Gen. 3 x8, providing CPU-free ultra-fast offload capacity of up to 64 Gb/s. Huge data buffers of up to 16 GB fortify the acquisition bandwidth and the image processing capabilities on powerful Arria 10 FPGAs.

The HawkEye is supported by Gidel’s Proc Developer’s kit, which includes the ProcFG GUI application, an API library and examples for developing a customized application, and the ProcWizard application for efficient development of image processing algorithms on FPGA.
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FEATURE SPECIFICATIONS

Camera Interface
1 80-bit (Deca), Full, Medium or Base
Camera Link or 2 Base
Camera Links with option for PoCL

Image Formats
Mono, Bayer, RGBA (8, 10, 12, 14 and 16 bits/color) and RGB (8, 10 and 12 bits/color).

Resolution
Horizontal: 16 M pixels (24-bit)
Vertical: 65 K lines

Tap Configuration
All configurations as defined by the Camera Link standard, including 80-bit (Deca): 10 taps/8bits, 8bits/10taps.

Connectors
2x SDR26 (mini Camera Link)
VGA15-pin I/O

Pixel Clock
Up to 85 MHz

Max Acquisition Rate
Up to 50 Gb/s acquisition rate

Host Bus
PCIe x8 Gen. 3

Host Throughput
Up to 64 Gb/s

Frame Buffer
1-16 GB

Dimensions
Compiles to PCI Express standard low-profile form factor

FEATURE SPECIFICATIONS

Form Factor
PCI Express x8 Gen. 3

MTBF
> million hours

Camera Types
Area and Line

GPIO
RS422, opto-coupler, LVTTL and 30V at 0.9A

Advanced Features
Selective ROI acquisition

Software Support
ProcFG GUI, API and examples. For open FPGA grabber version, ProcWizard Development tool

OS Support
Win 7, 10 and Server 2012 (64-bit) and Linux (kernel 2.6.x-3.10.x). Linux version doesn't include ProcFG GUI

Image Processing
For open FPGA grabber version, option for adding image processing code on Altera Arria 10 FPGA

Certifications
RoHS, Conflict Minerals, ISO

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Typical HawkEye acquisition and processing system implementation

From Host (PCIe x8 Gen. 3, up to 64 Gb/s)

HawkEye

Camera Interface
Camera Interface (CoaXPress/Camera Link/Remote/Userinterface)

Pixel Reordering

Image Processing A
(Gidel + User IPs)

Image Processing B

User Application

Based on ProcFG API Suite

ProcFG + ProcWizard Applications

External I/Os

Image Output

Pattern Generator

1-18 GB On-Board Memory

To Host (PCIe x8 Gen. 3, up to 64 Gb/s)

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