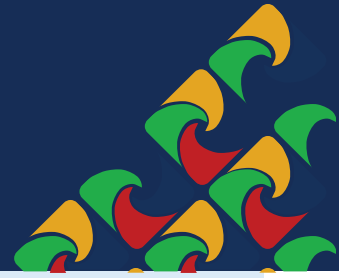# HawkEye-CL

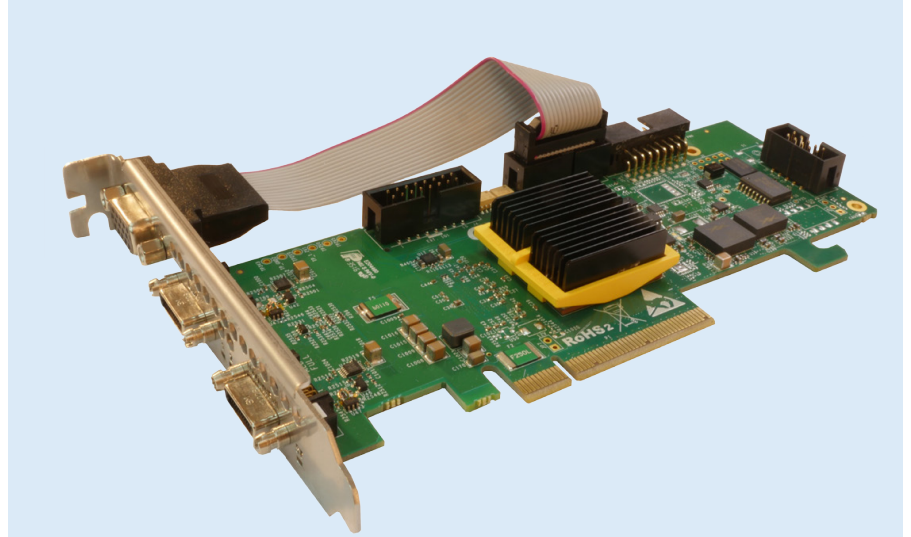## Camera Link Frame Grabbing and Image Processing System

Key Features

- Camera Link Rev. 2.0 compliant
- Camera Link modes: Base, Medium, Full, 80-bit (Deca)
- Option for connecting two Base cameras
- Pixel formats supported: Mono, Bayer, RGBA (8, 10, 12, 14 and 16 bits/color) and RGB (8, 10 and 12 bits/color).
- 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.
- Infrastructure for full Vision/Imaging system solutions, including image acquisition, real-time image processing, and post-processing on host.
- Flexibility to realize any camera interface and protocol for streaming the camera data directly to the FPGA.
- 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. The HawkEye-CXP is also supported by Gidel's HLS application support package for compiling untimed C++ code to FPGA HDL code using Intel's HLS compiler.

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).
Max. Resolution	Horizontal: 16 K pixels (64-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
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

FEATURE	SPECIFICATIONS
Form Factor	PCIe low-profile
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
Operating Ambient Temperature	0 – 54 C, relative humidity up to 90% (non-condensing)
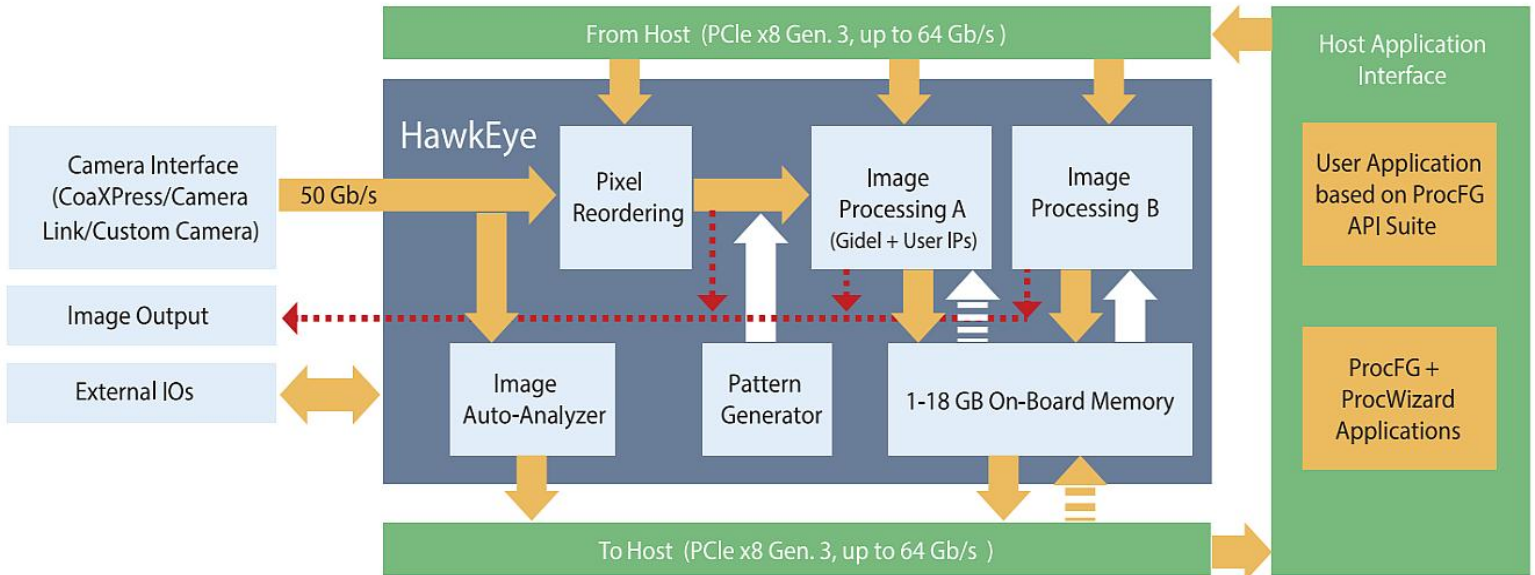
Typical HawkEye acquisition and processing system implementation