# 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 2 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 via PCIe Gen. 3 x8 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.
- ProcVision suite for developing, debugging, verifying and integrating user Image Signal Processing (ISP) block on FPGA.

## 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
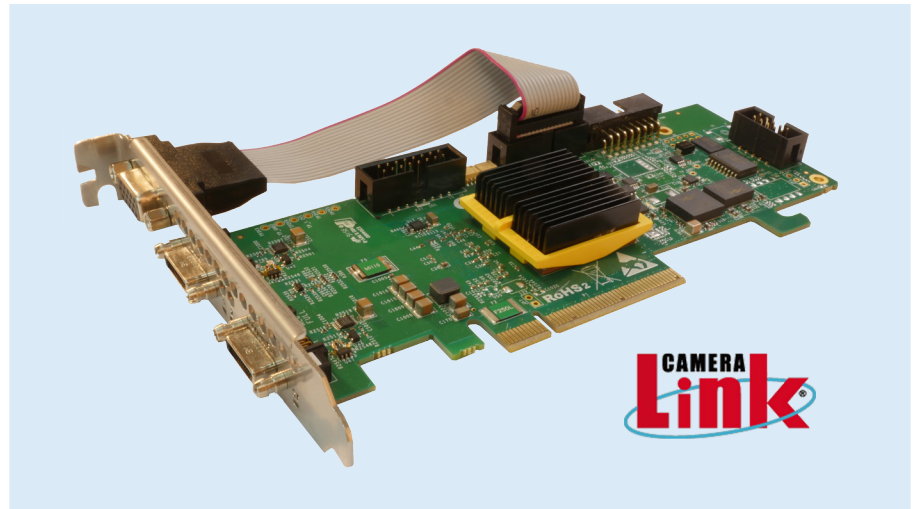


The Gidel HawkEye-CL frame grabbing and real-time image processing system provides the core infrastructure required to support the most demanding Vision and Imaging applications.

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.

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 host throughput. Huge data buffers of up to 16 GB fortify the acquisition bandwidth and the image processing capabilities on powerful Arria 10 FPGAs.

The HawkEye-CL is supported by the ProcFG and InfiniVision GUI applications, API library and examples for developing a customized application. For on-FPGA image processing, Gidel provides the ProcVision suite that includes the CertifEye kit for developing and verifying the user IP block, and the ProcWizard application for integrating the user's IP and for customizing the acquisition and image processing flow. The HawkEye-CL is also supported by Gidel's HLS ASP 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 for connecting GPIO |
| Pixel Clock | Up to 85 MHz |
| Acquisition Rate | Up to 25 Gb/s acquisition rate |
| Host Bus | PCIe x8 Gen. 3 |
| Frame Buffer | 1-16 GB |
| Operating Ambient Temperature | 0 – 54 C, relative humidity up to 90% (non-condensing) |

| 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 and InfiniVision GUI, API and examples. |
| Image Processing Dev Tools (For Open FPGA grabber versions) | ProcVision suite:<br>• CertifEye: develop and verify Image Signal Processing block (ISP)<br>• ProcWizard: integration of user ISP and customization of Vision/Imaging system<br>• TotalHistory: virtually infinite FPGA signal visibility enabling rare-bug fixes<br>• Support for HLS (untimed C++), HDL and combination of both |
| Certifications | RoHS, Conflict Minerals, ISO |
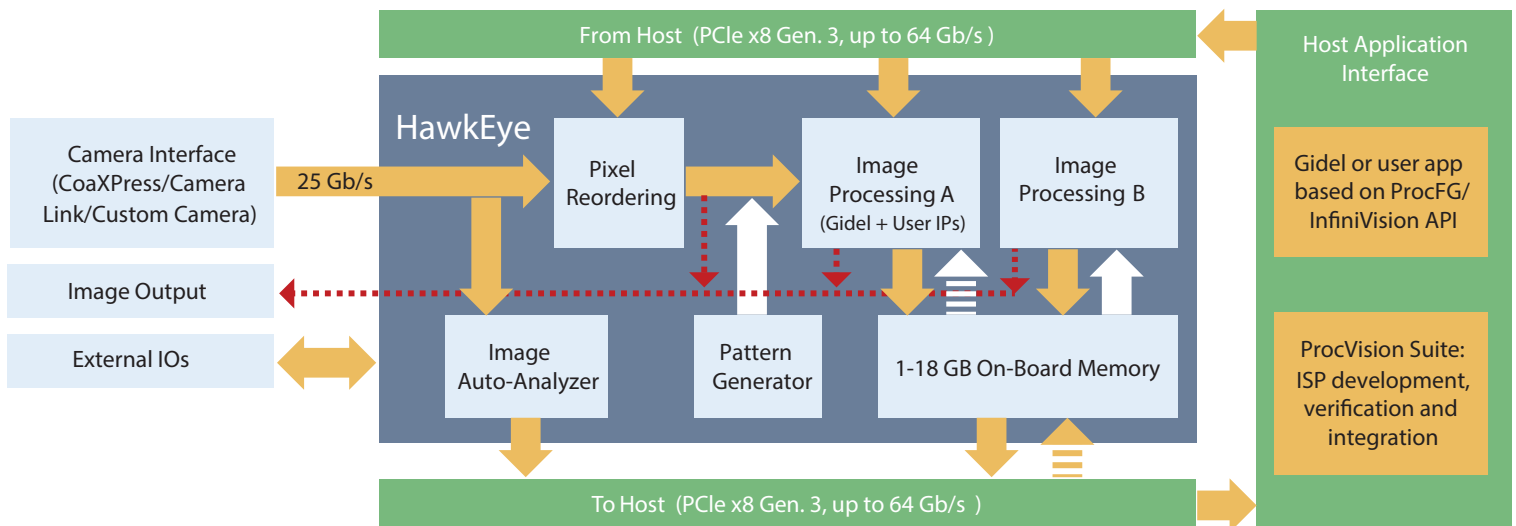


**Typical HawkEye acquisition and processing system implementation**

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