

HDR IP Correction

High-Quality Real-Time HDR



Key Features

- High-quality single-exposure HDR with dynamic luminance balancing
- Supports real-time processing of images >100 MP
- Enhances dark areas while preserving contrast in bright regions
- Dynamic per-pixel analytics optimize brightness and contrast
- Enables image sharpening
- Prevents noise amplification during contrast enhancement
- 8-31 bits/color input and output
- Up to 64K Pixels per line
- Unlimited number of parallel pixels per clock for any desired throughput
- Small foot print – 100Gb/s may be processed at the smallest Arria 10
- Virtually zero-latency
- Offload CPU by easily integrating into ISP pipeline: e.g., Debayering ->HDR ->White Balance ->Compression
- Optional: Full ISP pipeline customization using the ProcVision SDK

Target Applications

- Outdoor Imaging
- Aerial mapping
- Orthophoto
- Sports broadcasting
- Augmented reality
- Outdoor High-Resolution Sensors (HRS)
- Volumetric imaging
- Medical imaging
- Homeland security

Example: Real-Time HDR Correction for Outdoor Imaging (HRS)



HDR IP Correction: High Performance Single Exposure

While traditional HDR relies on multiple exposures — a method often impractical for applications involving motion or high data rates — Gidel's High Dynamic Range IP overcomes these limitations with an innovative single-exposure algorithm. This FPGA-based solution delivers uncompromised HDR quality and real-time performance.

Superior Image Quality with Unlimited Throughput

Gidel's IP provides real-time, high-quality HDR with virtually zero latency. It stands out by analyzing not only the luminance data of each pixel but also the surrounding pixels, dynamically adjusting HDR processing to account for local luminance variations. This environment-sensitive approach enhances subtle details, even in challenging HRS lighting, to deliver data with exceptional fidelity.

HDR IP High-Volume Processing

Gidel's proprietary HDR algorithm uses FPGA architecture to process multiple pixels simultaneously. This enables high-speed, efficient performance across an ultra-wide field of view. It is the ideal solution for high-throughput, outdoor HRS pipelines.

Integration in ISP Pipeline

Gidel's HDR correction provides powerful CPU offloading, integrating seamlessly into all Gidel's frame grabber systems.

HDR Includes

High-Quality Demosaicing, White Balance, Dynamic Luminance Balance and Gidel Compression IPs (.JPEG, Lossless, Quality+)



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Key Advantages of Gidel's HDR

- **HDR processing** is possible with single exposure.
- **Enhanced Detectability:** Outperforms conventional semi-real-time software-based HDR processing, delivering enhanced detail and detectability.
- **Unlimited Frame Size:** Please contact us if you need more than 64K pixel per line or more than Mega Lines per frame.
- **Unlimited Throughput:** Gidel's HDR low footprint, high clock rate and processing unlimited number of pixels per clock enables to reach any desired Throughput.

Performance Examples (for 12 bit per color)

FPGA	Speed grade	Image format	Width	Clock (Mhz)	Pixels/clock	MPixel / sec	ALM	M20K	DSP block
Agilex-5-EB	4	Bayer	16K	375	4	1,500	1,500	22	8
Agilex-5-EB	4	YUV 422	16K	310	4	1,240	1,700	34	18
Arria10	2	Bayer	16K	280	4	1,120	1,450	22	14
Arria10	2	YUV 422	16K	270	4	1,080	1,800	34	18
Arria10	2	YUV 422	16K	250	32	8,000	13,100	75	144
Arria10	2	YUV 422	32K	245	32	7,840	13,200	102	144

Gidel - Comprehensive Modular Vision and Imaging Solutions

The HDR IP is part of Gidel's robust modular solutions for optimized high-end vision and imaging solutions, including compact Jetson-FPGA edge computers, high-performance GigE Vision, CoaXPress, and Camera Link modular frame grabber systems, compact grabber modules, recording and streaming solutions, and more.



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