

# Because the Highest Dynamic Range Matters!

## Pinnacle Imaging Systems New Denali-MC HDR ISP

End-to-End, Motion-Compensated, Camera Ready, 100 dB HDR Video and Still Surveillance ISP

### Introducing the Denali-MC HDR ISP Platform

Pinnacle's new Denali-MC HDR video and HDR still ISP platform is designed to be the most flexible ISP on the market and with limited development\* can support 29 different HDR capable CMOS image sensors, including 9 Aptina/ONsemi, 6 Omnivision and 11 Sony sensors and 12 different pixel-level gain and frame-set HDR methods.

Denali-MC is currently demonstrated on a Xilinx Zynq 7010 FPGA, but can be utilized on DSP and SoC + DSP, (including TI and Qualcomm). The Denali-MC platform utilizes a Sony IMX290LQR sensor with multiple frameset output and Sony's DOL HDR modes driven by a Xilinx Zynq 7000 FPGA.

### Denali-MC Topline Specifications:

- Maximum output 1080p/60fps
- 16-bit processing
- 2-4 brackets up to 8 EV frame offset
- Up to 16 EV stops for output HDR
- LATM (tone map) up to 24 EV
- Noise reduction due to merging of 10 EV LDR to a single 16 EV HDR - up to 64x (compared to input LDR).
- LATM (locally adaptive) reduces system noise by 8x
- Sony Starvis IMX290LQR low illumination sensor
- Xilinx Zynq 7010 FPGA using 45% of resources

\*Algorithms require adjustment to various sensor characteristics

### Denali-MC End-to-End HDR ISP Platform Cores

At the heart of Pinnacle's Denali-MC surveillance ISP are world-class algorithm-based cores, achieving a combination of highest possible DR while compensating for HDR motion artifacts and providing an end-to-end, camera ready full ISP.

Having the highest DR and a Denali-MC ISP in a camera system can be the difference in capturing unusable video and capturing the highest possible recognition quality video in any scene, any time of day, 24/7.

### Denali-MC ISP Cores:

- Auto sensor calibration
- 4 proprietary IP cores (critical to merge block IP)
- Bad pixel correction
- Veiling glare
- Noise suppression
- Auto exposure
- Auto white balance
- Ultra HDR II variable frame merge
- LATM Locally Adaptive Tone Mapping
- Auto black point
- Sharpening
- Automated controls
- Simultaneous Ultra HDR II still and Ultra HDR II video
- CCM readjustment
- RAW data transfer

# Great Analytics Deserve the Best HDR Video!

## Pinnacle Imaging Systems New Denali-MC HDR ISP

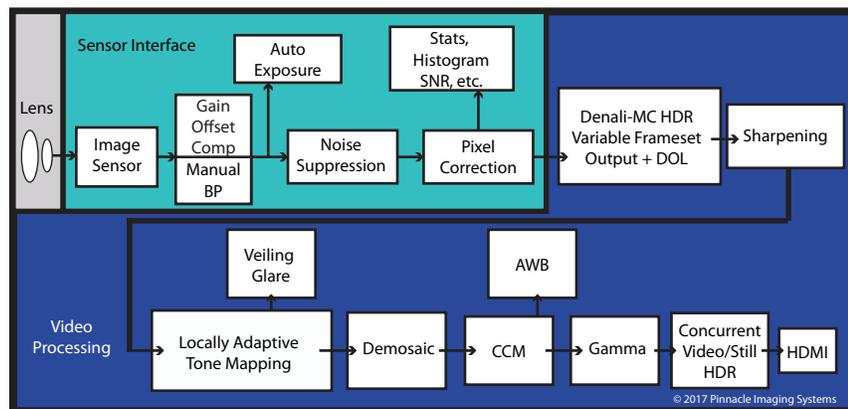
End-to-End, Motion-Compensated, Camera Ready, 100 dB HDR Video and Still Surveillance ISP

### Denali-MC Concurrent HDR Video & HDR Image

A unique added benefit within the Denali-MC platform is the capability to produce a full resolution 1080p HDR video stream while concurrently capturing full resolution still HDR images. This process can be pre-selectable for interval, duration and resolution or activated by an event, then automated into a system.

This one-of-a-kind method provides camera makers the added advantage of capturing a complete evidence package or allows still HDR images to be routed to mobile apps or to Public Safety Answering Point operators to instantly react to threats.

### Denali-MC End-to-End HDR ISP Platform Diagram



### Denali-MC Platform - 24/7 - Any Scene Capabilities

The Denali ISP platform is primarily a HDR video and image platform, so camera placement is not constrained by the dynamic range of any scene. The platform has the capability of capturing high quality video in every scene regardless if it is a combination of deep shadow and bright open sunlight or a dark home or business into open sunlight.

Denali-MC's image sensor is one of the best low illumination sensors available, the Sony Starvis IMX290LQR. Pinnacle will provide two choices of HDR modes, currently frameset output and adding DOL soon. Both modes are dependent on the required application and are used with Pinnacle's LATM. The IMX290LQR also provides near IR when used with IR LED.

### Pinnacle Imaging's Custom Solutions Development

Pinnacle Imaging Systems can customize a HDR camera solution for you. Pinnacle's imaging scientists and engineering implementation teams can produce a customized camera solution utilizing one of the 29 HDR capable sensor types on various logic and compute platforms including FPGA, ASIC, DSP or DSP+SoC or ARM. We also develop custom algorithms for implementation in camera systems. We're affordable and timely.

Ask for a demo or for more information contact our support team at:

[www.ultraHDRvideo.com](http://www.ultraHDRvideo.com)

Tel: 650-740-1557

or contact: [ron@pinnacleimaging.com](mailto:ron@pinnacleimaging.com)

