

# Camels Intellectual Property (IP) Series

## Model NexIP™

Based on in-depth understanding of embedded system design and digital image processing, CAMELS VT specializes in embedded image/video platform & algorithm design for applications such as video analytics, machine vision, and other digital imaging. We have developed a substantial intellectual property (IP) portfolio in camera and image processing technology. Our IPs are available for licensed users to make their project development easy. Besides off-the-shelf IPs, we welcome you to propose your specifications and share in the process of developing algorithms customized specifically for your applications. Please visit our website: [www.camels.com.tw](http://www.camels.com.tw) or contact us for the most up-to-date IPs list.

### Key Features

- Production-tested IPs optimized for a portfolio of FPGA and DSP platforms
- Xilinx® FPGA-based IPs
- Xilinx® MicroBlaze™(32-bit RISC core)-based IPs
- Texas Instruments Inc.'s (TI) video DSP, Digital Media Processor (DMP), DaVinci™ Digital Media System-on-Chip (DMSoC)-based IPs

### FPGA-based IPs

Product Name	Type	Supported Devices
<b>Image Enhancement</b>		
Wide dynamic range (WDR)	IP Core	Virtex™-II, Spartan™-3
Histogram equalization	IP Core	Virtex™-II, Spartan™-3
Laplacian filter	IP Core	Virtex™-II, Spartan™-3
<b>Camera Controls, CCD/CMOS Image Signal Processor (ISP)</b>		
Camera timing generator (TG), camera front-end	IP Core	Virtex™-II, Spartan™-3
Camera DSP/controller, image-processing pipeline	IP Core	Virtex™-II, Spartan™-3
- Flat field correction		
- Color spatial correction for trilinear CCD		
- Bad pixel correction		
- Auto tap balancing for multi-tap CCD		
- SDRAM controller		
- Look up table (LUT)		
- Auto analog gain		
- Digital gain		
- Bit-banged I2C bus controller		
- Pixel depth conversion		

### Camera Interface



Camels Vision Technologies Inc.  
1F, No. 9, R&D Rd. I, Hsinchu Science Park, Hsinchu City, Taiwan 30076  
Tel:+886-3-563-2816 Fax:+886-3-563-2815  
E-mail: [info@camels.com.tw](mailto:info@camels.com.tw) Web site: <http://www.camels.com.tw>  
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Camera Link®	IP Core	Virtex™-II, Spartan™-3
<b>Application, Utility</b>		
Discrete-time PID controller	IP Core	Virtex™-II
Neighbor cell comparison (NCC) for panel defect detection	IP Core	Virtex™-II Pro

### DSP-based IPs

Product Name	Type	Supported Devices
<b>Image Enhancement</b>		
Auto exposure	IP Core	DM64x
Auto gain	IP Core	DM64x
De-interlacing	IP Core	DM643x
Lens distortion correction	IP Core	DM643x
Wide dynamic range (WDR)	IP Core	DM643x
Histogram equalization	IP Core	DM64x, DM643x
Video resolution scaling	IP Core	DM643x
<b>Video Analytics</b>		
Object classification	IP Core	DM64x, DM643x
“Inside of” event notification	IP Core	DM64x, DM643x
Tripwire event detection	IP Core	DM64x, DM643x
<b>Application, Utility</b>		
Video scrambler	IP Core	DM64x, DM643x
Panel Mura detection	Reference Design	DM64x
1-D bar code recognition	Reference Design	DM64x

### PC-based IPs

Product Name	Type	Supported Devices
<b>Image Enhancement</b>		
Auto exposure	IP Core (DLL)	PC
Auto gain	IP Core (DLL)	PC
Lens distortion correction	IP Core (DLL)	PC
Histogram adjustment (brightness and contrast)	IP Core (DLL)	PC
Image averaging	IP Core (DLL)	PC
Auto white balance	IP Core (DLL)	PC
Color correction	IP Core (DLL)	PC



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Edge enhancement (sharpness)	IP Core (DLL)	PC
Flat field correction	IP Core (DLL)	PC
Gamma correction	IP Core (DLL)	PC
Histogram (Contrast) equalization	IP Core (DLL)	PC
<b>Image Processing</b>		
Convolution	IP Core (DLL)	PC
HIS to RGB	IP Core (DLL)	PC
Mirror	IP Core (DLL)	PC
RGB to Gray	IP Core (DLL)	PC
RGB to HSI	IP Core (DLL)	PC
RGB to YCbCr	IP Core (DLL)	PC
YCbCr to RGB	IP Core (DLL)	PC
<b>Application, Utility</b>		
Object size measurement	IP Core (DLL)	PC

Products and specifications are subject to change without notice.



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