HIGH-DEFINITION VIDEO CONFERENCING, SURVEILLANCE AND MACHINE VISION SYSTEMS WITH XILINX FPGAS

XILINX INDUSTRIAL IMAGING SOLUTIONS

Industrial Imaging Design Challenges

- Escalating processing power required for image processing and analysis
- Meet design requirements for rapidly changing data formats, interfaces, and image processing
- Shorter design cycles and reduced development costs

The Xilinx Solution

- Powerful parallel processing for high resolution video with integrated digital signal processing (DSP) and distributed memory
- Flexible interface solutions with configurable high speed serial and parallel I/O
- Comprehensive portfolio of proven system and image processing IP, tools, reference designs and complete development kits

Evolving product requirements in the industrial imaging market are creating the need for architectures that support improved image resolutions, the ability to meet changing image processing algorithms, specialized image sensor interfaces, and evolving image analysis requirements — driving system architects to look beyond typical ASSPs and ASICs to field-programmable gate arrays (FPGAs).

The Xilinx Targeted Design Platform brings together key elements needed to design FPGA based industrial imaging systems, allowing design teams to spend less time developing the infrastructure of an application and more time building differentiating features into the end application. As part of the platform, the Spartan®-6 FPGA Industrial Video Processing Kit is a comprehensive design environment for rapid prototyping and development of advanced industrial imaging systems. Comprised of the necessary hardware, software, cables, and user manuals, developers can meet evolving image processing algorithm and interface standards requirements, while delivering next-generation products with fewer resources, smaller budgets, and tighter schedules.

Xilinx FPGAs at the Center of High Resolution Video Applications

The Virtex® and Spartan FPGA families offer ideal combinations of performance and flexibility for high resolution video applications. The FPGA architecture, integrated digital signal processing (DSP) blocks, distributed block memories and scalable device families provide the processing power for the most demanding image processing and analysis applications. Flexible FPGA interconnect and fully programmable I/O are easily configured to meet system architecture requirements.

Extensive IP Library for Complete Systems

An extensive library of intellectual property (IP) available from Xilinx and its Alliance members can be leveraged as the foundation for complete industrial imaging products — reducing time-to-market while reducing overall risk and cost. Scalable image processing blocks enable products with resolutions from standard definition to high-definition 1080P60. Wide dynamic range processing and/or high-performance video analytics can be added to target products for specific markets. The powerful combination of scalable image processing IP, flexible interfaces, optional specialty IP and scalable FPGA devices allows customers to develop specialized products for different markets that leverage common architecture and IP.

XILINX®

Sample Industrial Imaging Intellectual Property

Image Processing IP

Edge Enhancement
Defective Pixel Correction
Color Filter Array Interpolation
Gamma Correction
Color Correction
Noise Reduction
Color Space Conversion
Video Scaler
Chroma Resampler
Image Statistics (3A, Histogram)
On-Screen-Display
Video Timing Controller
Video DMA
Motion Adaptive Noise Reduction

System Processing IP

Multi-Port Memory Controller
Video Frame Buffer Controller
MicroBlaze™ Processor

Bus Interface and I/O IP

10/100/1000 Ethernet MAC
PCIe®
PLB Bus Structure
RS233, UART, CAN

Specialty IP

Video Analytics
Wide Dynamic Range Compression
GigE Vision

Spartan-6 Industrial Video Processing Kit

Photo representation only. Actual kit content appearance may vary.

For more information and a complete list of kit features, please visit **www.xilinx.com/s6ivk**

Ideal development environment for rapid prototyping and streamlined development of high resolution digital video conferencing, video surveillance, and machine vision systems.

Kit Features Overview

- Spartan-6 LX150T FPGA Development Board
- Two Daughter Cards
  - Dual image sensor input with DVI/HDMI output
  - DVI/HDMI input and output
- Omnivision OV9715 720P Image Sensor
- Xilinx ISE® Development Suite System Edition (Device Locked for Spartan-6 LX150T)
- Reference Designs
  - Camera processing with external memory
  - DVI video processing
  - DVI with external memory buffer
  - Hardware co-simulation demonstration
- Manuals/User guides
  - Hardware Getting Started Guide
  - Reference Designs Guide
- Power Supply and Cables

Take the **NEXT STEP**

For more information, please visit **www.xilinx.com/esp/ism.htm**

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