mikroprojekt

IP Solutions

IQ-Video: Advanced Video Mixing IP Solution

IQ-Video is an advanced FPGA solution for high definition video interfacing, mixing, and display based on the Lattice ECP3 FPGA and the Mikroprojekt Peregrine bus system.

The IQ-Video solution allows easy interfacing, adaptation and mixing of multiple video sources of various origins. The solution is capable of performing video mixing with advanced effects, such as blending, overlay, side by side, or picture in picture.

Video streams of various resolution, frame rate, color spaces and color depth can be combined into one or more output streams. Video can be combined with static or dynamic graphics such as logos or banners.

Graphical overlays can employ both overall and per-pixel alpha transparencies to implement anti-aliased OSD graphical elements.

Transitions between various mixing combinations are easily animated with moving, scrolling, panning and scaling effects on live video streams. The mixed video stream can be displayed on one or more standard or embedded monitors, or transmitted over a specific video interface such as DVI, HDMI, HD-SDI or others.

The embedded Lattice Mico32 controller allows advanced visual effects and animations and is fully programmable with the standard LatticeMico System Suite. The IQ-Video IP solution is fully supported and can be licensed directly from Mikroprojekt.

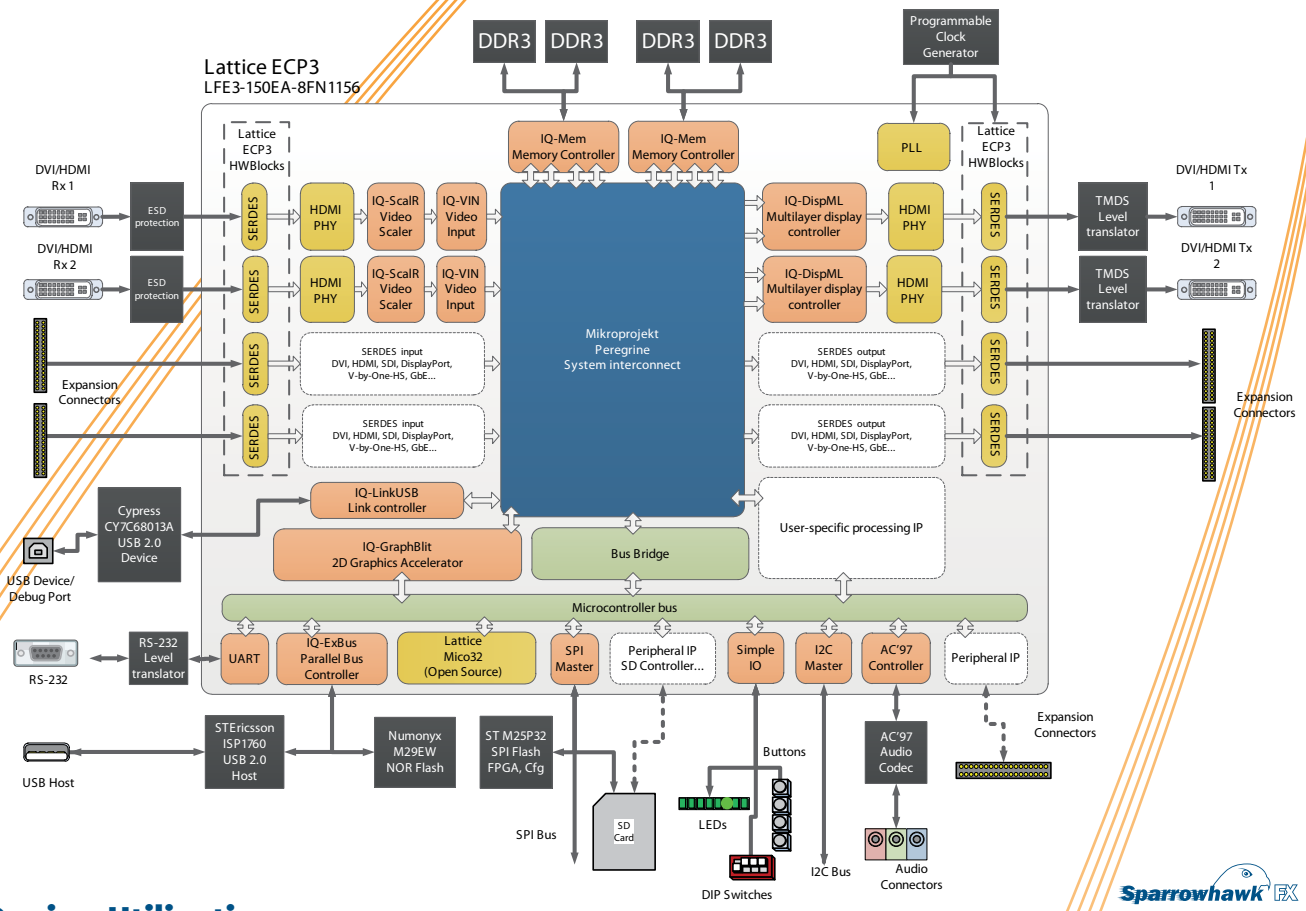
IP Blocks

IP Block	Function
IQ-DispML	Multi-layer display output controller
IQ-VIN	High performance video input/frame grabber
IQ-ScalR	High performance polyphase video scaler
IQ-MEM	Multi-port DDR2/DDR3 Memory Controller
Peregrine	High efficiency, video specific SoC interconnect
IQ-Link	Flexible debug and control link

Key features

- FPGA-based video processing solution
- Supports 1080p video at 60 fps
- Advanced video combining capabilities
- Mixing of video streams and static graphics
- Alpha blending and transparency effects
- Smooth transitional effects
- Fading, scrolling, scaling, cropping and movement
- Low processing latency
- Arbitrary resolution and frame rate of inputs
- Embedded DDR2/DDR3 frame buffer memory controller
- Embedded LatticeMico32 CPU supports automatic initialization, smooth animations, and embedded graphics

Solution Architecture



Device Utilization

Device/Cfg.	LUT4	REG	EBRs	MULs	PIOs
ECP3-150[1]	51234	36240	111	152	225
ECP3-95[2]	27985	21864	87	90	120

[1] Sparrowhawk FX reference design with dual-channel DDR3, dual DVI/HDMI inputs and outputs, and peripherals
[2] Dual HDMI input, single HDMI output, video mixing configuration only, single channel DDR2 controller, Lattice ECP3 Video Protocol Board

Target applications

- Digital signage
  - Video walls
  - Visual installations
- 3D display systems
  - Stereo projection systems
  - Autostereoscopic displays
- DVRs
- Real-time video processors/scalers
- Machine vision

mikroprojekt

Design, development and production of electronic and computing systems

Aleja Blaža Jurišića 9
10040 Zagreb
Croatia

tel/fax: +385 1 2455 659
mail: contact@mikroprojekt.hr

http://www.mikroprojekt.hr

Mikroprojekt is a Lattice Semiconductor LatticeCore Connection IP partner and a member of LEADER, the Lattice Exclusive Alliance of Design Engineering Resources.

For more information, visit: http://www.latticesemi.com.

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