Designed to support acquisition, processing, and output of multiple high definition video streams, the Sparrowhawk FX is an advanced FPGA development board targeted for video acquisition, processing, and display applications, based on the award-winning LatticeECP3™ FPGA.

The board is delivered pre-loaded with Mikroprojekt’s “IQ-Video” video processing IP suite, and works out of the box as a video combiner solution, demonstrating the capabilities of combining two video streams in combination with static or dynamic graphics.

Two banks of DDR3-800 memory are provided for frame buffering, delivering up to 6.4 GB/s in total, supporting up to four simultaneous 1080p60 video input and output streams over the two input and two output DVI-D connectors (single link), with additional 8 SERDES input and output differential pairs available for expansion as DVI-D, SDI, or other video interfaces.

Additionally, nonvolatile storage, USB host and device interfaces, AC’97 audio, SD card, and other standard features such as LEDs and keys are provided for purposes of prototyping and application development.

The Sparrowhawk FX development board offers unprecedented bandwidth and processing capabilities to video system designers. The preloaded IQ-Video IP library solution allows easy evaluation of high definition video processing operations, including frame by frame video scaling, video overlay with alpha transparency, mixing and overlay of static and dynamic graphics, smooth scrolling and panning.

The IQ-Video IP solution is fully supported and can be licensed directly from Mikroprojekt.

Key features

- ECP3-150 FPGA, speed grade -8
- 512 MB of DDR3-800 memory, 6.4 GB/s
- 2 DVI inputs and 2 DVI outputs
- Nonvolatile memory: SPI and parallel flash; SD card slot
- AC’97 Audio Codec
- Expansion I/O
- 114 GPIO pins, 8x SERDES in/out
- USB 2.0 Host and device; RS-232 link
- LEDs and keys
- Pre-loaded with the “IQ-Video” video processing and mixing solution from Mikroprojekt
- Demo design enables mixing of 1080p video streams with logo overlay, scrolling banner, Picture-in-Picture, side by side video
- Move, scroll, stretch and scale animations
- Easy set-up and control with push-buttons

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## Hardware features

### FPGA

- Lattice ECP3
  - LFE3-150EA-8FN1156
  - 149,000 LUTs
  - 327 Block RAMs
  - 256,576 Multipliers
  - 698 IO pins
  - 16 SERDES channels (In/out)
  - 400 MHz DDR3 Memory Support
  - 20 PLLs, 2 DLLs

### Expansion ports

- Expansion Connectors (3)
  - 1x Low Cost Expansion 2.54mm 30-pin header (22 GPIOs)
  - 1x Samtec OSH-010 Expansion Connector (48 GPIOs, 8 SERDES In, 8 SERDES Out, 2 dedicated clock input)
  - 1x Samtec OSH-030 Expansion Connector (44 GPIOs, 2 dedicated clock inputs)
  - 114 GPIO pins in total

### Video Memory

- DDR3-800
  - 2x Micron MT41J64M16JT-15E
  - 64 MB Total memory

### Video interfaces

- DVI-D/HDMI
  - 2x DVI/HDMI Input (DVI-D connector)
  - 2x DVI/HDMI Output (DVI-D connector)
  - DDC Supported on all in/out connectors

### Communication Interfaces

- Cypress CY7C68013A USB 2.0 Device
- STEricsson ISP1760 USB 2.0 Host
- RS-232 Interface
- 12C Bus (On all expansion connectors)

### Other peripherals

- Push-buttons (4)
- DIP Switches (4)
- LEDs (8)

### Nonvolatile storage

- Numonyx M29EW Parallel NOR Flash
  - 512MB (64 MB)
  - factory expandable to 2GBs (256 MB)
- ST M25P32 SPI Flash (FPGA Configuration)
  - 64 Mbits (8 MB)
  - Secure Digital Card slot
  - SPI and SD interfaces connected to FPGA

### Power Supply

- 12V DC Input
- Power switch
- Onboard power supplies
  - 5V
  - 3.3V switching power supplies
  - 1V5 DDR3 switching power supply
  - FPGA 1V2 Core switching power supply
  - SERDES 1V5 voltage linear regulator

### Audio Interfaces

- Wolfson WM8707 AC’97 2.1 Audio Codec
  - Stereo Line Out
  - Stereo Line In
  - SPDIF Out

### Clocking

- Onboard 100MHz Oscillator
- Onboard Programmable Clock Generator for SERDES/Video Interfaces – SiLabs Si5338

## Target applications

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

## Ordering information

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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](http://www.latticesemi.com).

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