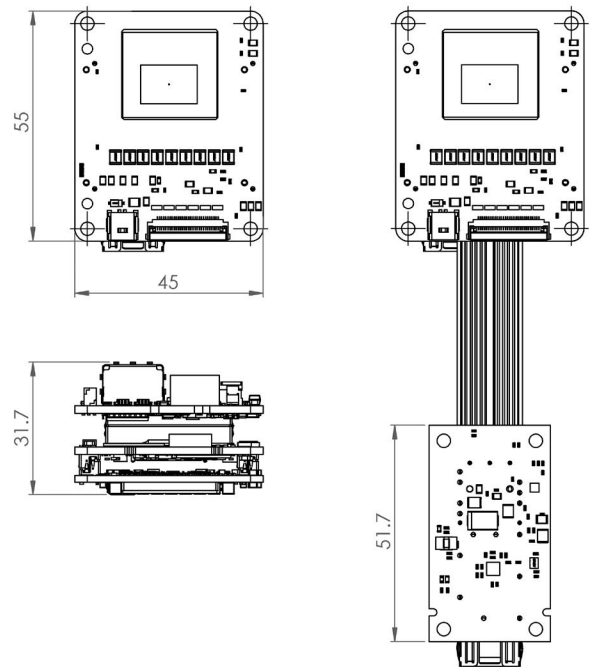


SPINOSAURUS LX EVO



Spinosaurus LX EVO is a highly customizable and user-programmable FPGA-based high-speed smart cameras, is a high-end FPGA camera with a Xilinx Zynq FPGA and high-speed imaging sensor and a 10 Gigabit Ethernet. It includes high-performance ARM System-on-Chip (SoC) technology combined with turbocharged industrial LUXIMA imaging sensors.

With high-performance FPGA System-on-Chip (SoC) technology, Spinosaurus LX EVO camera opens new dimensions in computer vision. It is a global shutter industrial camera with incredible frame rates and an open FPGA architecture. With its FPGA processing power the image processing algorithms can run in real-time on the camera. Spinosaurus LX EVO includes a fully customizable and user-programmable open-reference design for its high-speed FPGA-based camera and application development system. Its emphasis is on an open hardware/software development model, high-frame rates, real-time image processing on FPGA and modern graphical user interface support on the PC side.

A suite of versatile and high-performance tools for Xilinx Zynq Ultrascale+ SoC FPGA is used to develop algorithms and process data in real-time. Images are acquired by Luxima LUX2810 sensors with 32x LVDS interface (29 Gbps) achieving brilliant images at a very high speed. The on-board 2GB LPDDR4 memory with 19 GB/s of bandwidth enables usage of complex buffered image processing.

KEY CAMERA FEATURES

- Resolution: 3.0 MP (2112 x 1432);
- Frame Rate: 934 fps;
- Sensor Format: 1"CMOS;
- Pixel Size: 6.6 μm ;
- Sensor: high-speed industrial Luxima LUX2810 sensor, color (Bayer filter), monochrome;
- Interface: 10 Gigabit Ethernet SFP+ for fast data transmission;
- Programmable and reconfigurable FPGA with Quad ARM processor Zynq Ultrascale+.

The reference design can be easily edited with standard Xilinx Vivado tools. OptoMotive's custom IP cores seamlessly integrate inside the Xilinx Vivado toolchain. A large portion of FPGA (PL) is free for the programming and development of new algorithms, or the implementation of additional IP cores. The 1.2 GHz Quad Core ARM Cortex A53 Programmable Subsystem runs Linux OS with custom made EVO control and streaming stack (including Zero-copy TCP/IP stack). The SoC also includes dual 600MHz Cortex R5 processors which are free for user data processing. User applications or custom data post-processing can easily be added to the existing design.

APPLICATIONS:

- Laser triangulation - with a ready-made Peak detector on-board image processing core;
- Motion capture - with a ready-made BLOB detector or Running Length Encoder (RLE) on-board image processing core;
- Industrial process automation - to count, detect, check, verify, read, inspect and test different products, levels, components, etc. at an incredible speed;
- Industrial quality control - to inspect defects, cracks or surface blemishes, size, position, dimension and color, foreign objects or quality and
- General R&D.

CAMERA FAMILY		SPINOSAURUS LX EVO	
IMAGING SENSOR	Camera model	3.0M	3.0C
	Model (Luxima)	LUX2810M	LUX2810C
	Color Filter	Mono (M)	Bayer (C)
	Diagonal mm	16.84 (1")	
	Active pixels H x V	2112 x 1432	
	Frame Rate (Full Frame)	778 FPS (rev 1), 934 FPS (rev 3)	
	Pixel Size	6.6 µm	
	Dynamic Range	54 dB	
	ADC Resolution	12 bit	
	Analogue Gain	1x-8x at 1x step	
	Region of Interest	YES, with 16 pixel increments	
	Shutter Type	Electronic global shutter	
	Shutter Time	5 µs – 90 s	
	Pixel Clock Speed	2.4 Gpix/s (16 pixels @ 150 MHz for rev 1) 2.88 Gpix/s (16 pixels @ 180 MHz for rev 3)	
FEATURES	Exposure	Linear, Dual Gain High Dynamic Range	
	Pixel Correction	Dead pixel correction and Programmable LUT	
	Trigger Modes	Free running, trigger, overlap, pulse width	
	Trigger Features	Delay 0 – 1000 ms, LP Filter 1.5Hz - 100 kHz	
PROCESSING	Shutter Resolution	1.56 µs	
	FPGA	Xilinx Zynq Ultrascale+ ZU4CG	
	Free FPGA %	Up to 50%, most of the 728 slices of DSP are free.	
	Volatile Memory	2 GB LPDDR4 with 9.6 GB/s bandwidth	
MECHANICAL	Non-volatile Memory	64 MB QSPI flash, 8 GB eMMC	
	Lens Mount	C-mount (1" 32G thread)	
	Temp Range	0 - 50°C	
	Mass	TBD	
	Protection	Up to IP67 with housing	
	Housing Material	CNC-machined aluminum, anodized	
	RoHS	RoHS compliant	
	Fixing Holes	4x M3 OEM	
ELECTRICAL	Input Voltage	DC 9-36V or 5V (OEM)	
	Consumption	up to 30W	
	IO	20x 3.3V TTL ZIF	
	IO Isolation	3x IN / 3x OUT opto-isolated	
	Connectors	10G SFP+, 10 pin Hirose HR10A, ZIF on OEM	
FUNCTIONALITIES	On-board Image Processing	As an option (if an IP Core is integrated)	
	Open Reference Design	Yes	
	Open Architecture	Yes	
	Software	Compatible with OptoMotive EVO software (full source included)	
	Operating System	Windows 7, Windows 10, 64bit or 32bit	
	Development Tools	Xilinx Vivado/SDK version 2018.2 or later. Microsoft Visual Studio 2017	