Camera Technology

October 2025

CAMERA **FAMILIES**

SMILODON
SPINOSAURUS
T-REX
LOM

The eye of the master will do more work than both his hands.

- Benjamin Franklin

SMILODON EVO

KEY FEATURES

- High-resolution and high-speed Gpixel GMAX25xx sensors
- FPGA: Xilinx Zynq Ultrascale+ Kria K26
- Possible interfaces: 1 or 10 GigE

Resolution	5.0 MP	9.0 MP	18.0 MP	25.0 MP
Active Pixels (HxV)	2600 x 2160	4200 x 2160	4508 x 4096	5120 x 5120
Frame Rate	290 FPS	290 FPS	139 FPS	150 FPS
Sensor Format	**1/2"CMOS**	**2/3"CMOS**	**1"CMOS**	**1.1"CMOS**
Pixel Size	2.5 µm	2.5 µm	2.5 µm	2.5 µm
Sensor: Gpixel Sensor	GMAX2505	GMAX2509	GMAX2518	GMAX0505
Interface	**1 or 10 Gigabit Ethernet SFP+ for fast data transmission**			
FPGA	Xilinx Zynq Ultrascale+ Kria K26			

SPINOSAURUS EVO

KEY FEATURES

- SONY Pregius Gen3 SLVS-EC
- FPGA: Xilinx Zynq Ultrascale+ ZU4CG
- Possible interfaces: 10 GigE SFP+

SPINOSAURUS EVO					
Resolution	0.5 MP	2.0 MP	2.8 MP	1.7 MP	7.1 MP
Active Pixels (HxV)	816 x 624	1632 x 1248	1944 x 1427	1608 x 1104	3216 x 2208
Frame Rate	1590 FPS	470 FPS	408 FPS	660 FPS	200 FPS
Sensor Format	**1/1.7" CMOS**	**1/1.7" CMOS**	**2/3" CMOS**	**1.1" CMOS**	**1.1" CMOS**
Pixel Size	9 µm	4.5 µm		9 µm	4.5 µm
Sensor: SONY	IMX426	IMX422	IMX421	IMX425	IMX420
Interface	**10 Gigabit Ethernet SFP+**				
FPGA	Xilinx Zynq Ultrascale				

SPINOSAURUS LX EVO

KEY FEATURES

- High speed LUXIMA LUX2810 imaging sensor
- Good for laser triangulation

SPINOSAURUS LX EVO	
Resolution	2.8 MP
Active Pixels (HxV)	2048 x 1400
Frame Rate	1200 FPS, up to 100 kFPS in ROI
Sensor Format	**1" CMOS**
Pixel Size	6.6 µm
Sensor: Luxima	LUX2810
Interface	10 Gigabit Ethernet SFP+
FPGA	Zynq Ultrascale+

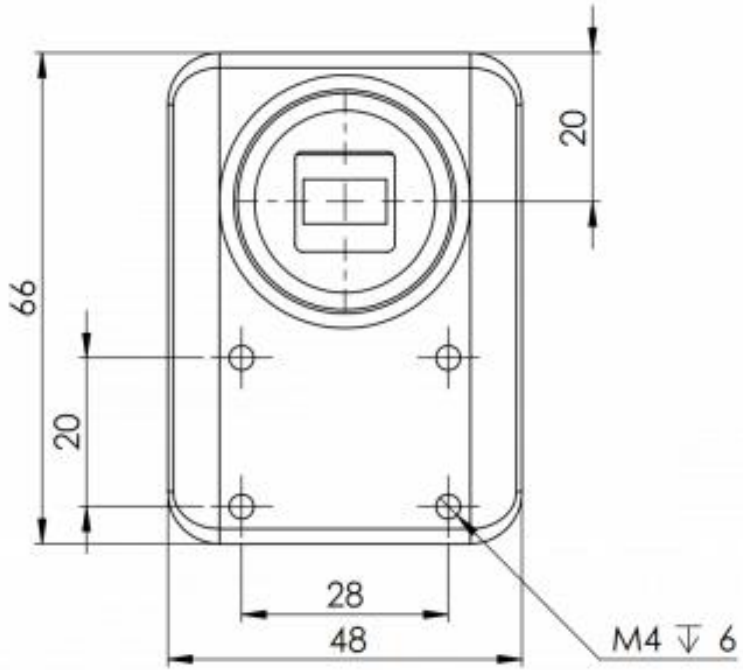
T-REX EVO

KEY FEATURES

	T-REX EVO	
Resolution	2.2 MP	4.2 MP
Active Pixels (HxV)	2048 x 1088	2048 x 2048
Frame Rate	331 FPS	176 FPS
Sensor Format	**2/3"CMOS**	**1" CMOS**
Pixel Size	5.5 µm	5.5 µm
Sensor: CMOSIS Image Sensor	CMV2000	CMV4000
Interface	**1 Gigabit Ethernet SFP+ for fast data transmission**	
Programmable and Reconfigurable FPGA	Zynq 7020	

T-REX SH EVO


T-REX | OPTOMOTIVE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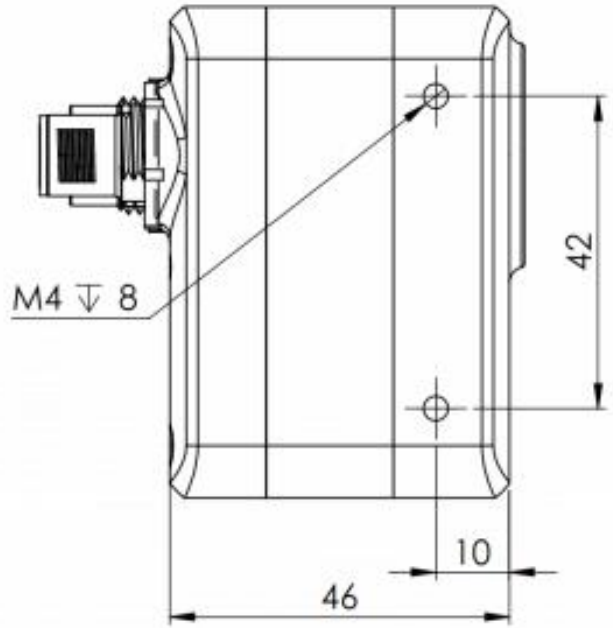
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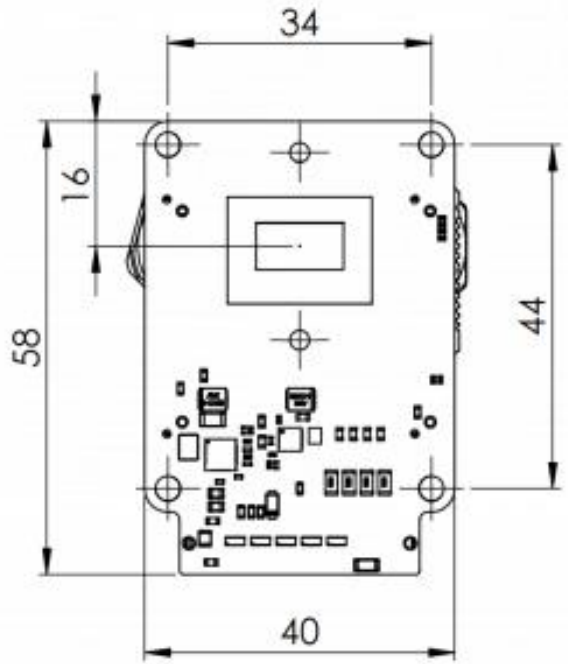
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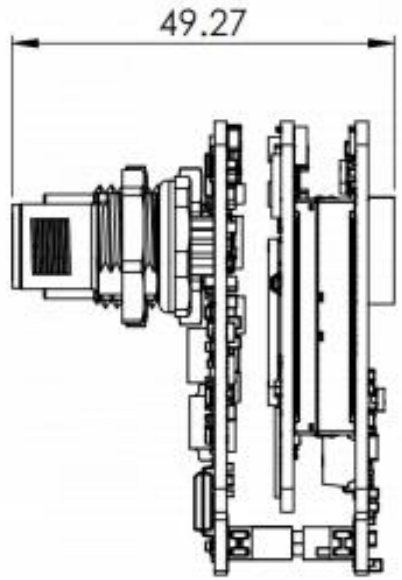
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LOM SERIES

3D LINE PROFILE SENSORS

LOM PRODUCT FAMILY

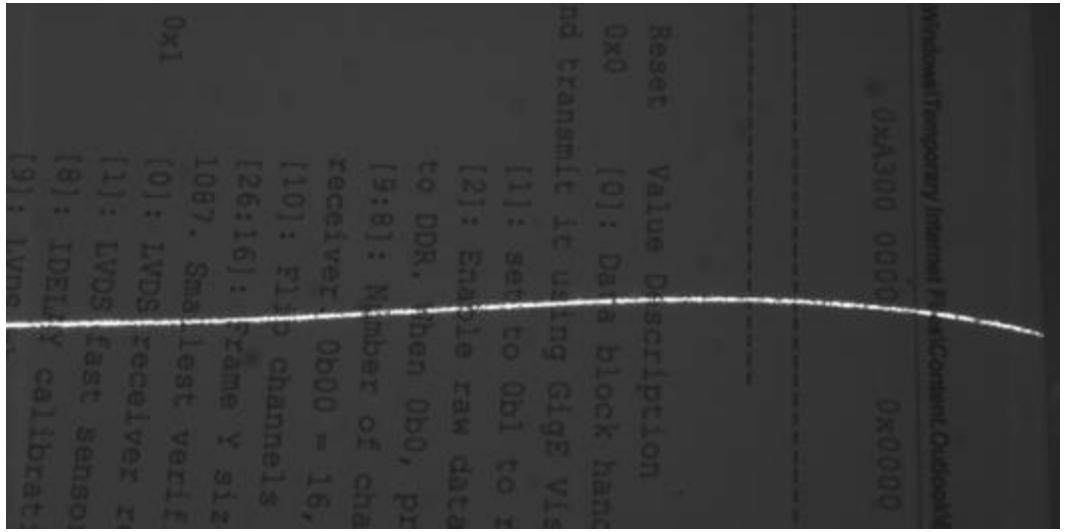
Model		LOM025	LOM100	LOM125	LOM220
Data points / Profile		2048	2048	2048	2048
T angle [°]		35	21	25	19
RESOLUTION X [µm]	near	11	28	50	80
	mid	13	36	62	110
	far	14	50	80	160
RESOLUTION Z [µm]	near	1,5	6	9	18
	mid	1,9	9	14	32
	far	2,3	18	26	77
Field of View [mm]	X near	23	57	102	163
	X mid	25	73	126	219
	X far	28	102	164	332
	Z	21	107	162	400
Working distance		56	98	173	310
Measurement Range (mm)		21	107	162	400
Laser		Blue	Blue	Blue	Blue

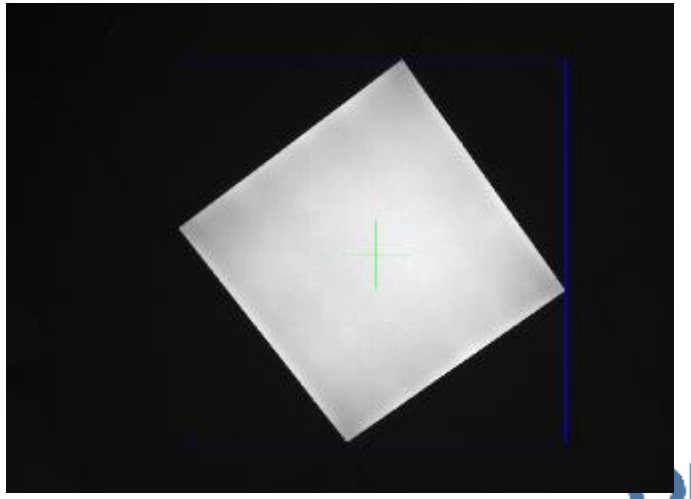
FPGA Technology

- Where microseconds matter!
- Super low latency (below 100us).
- We use Zynq SoC FPGAs with powerful ARM CPUs and Linux on board.
- Zero-copy networking stack capable of 9 Gbps TCP/IP image transmission and UDP at wire speeds.
- PARALLEL image processing blocks enables massive real-time image processing:
    - Peak Detection
    - BLOB Detection
    - Image Compression: RLE and lossless
    - Dead pixels correction
    - LUT
    - FPN correction

FPGA IP

- High-speed Peak detection for laser triangulation:
  - Massive 7x16 pixels filter for noise reduction
  - 8 bit subpixel precision
  - Multiline capable
- High-speed BLOB detection:
  - Segmentation
  - Intensity weighted COG calculation
  - Min and max size limits adjustable





FPGA IP

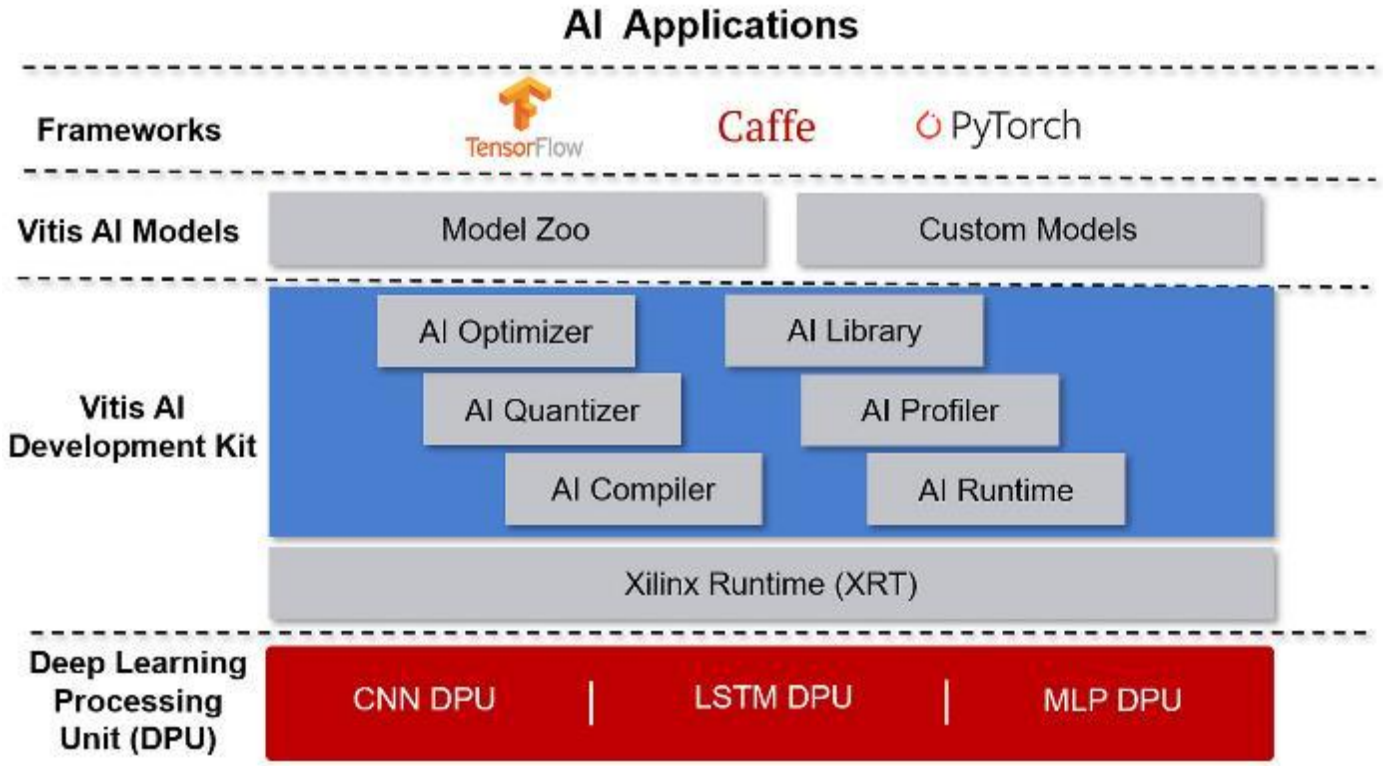
- Lossless image compression:
  - Can compress also Bayer image without demosaicing
  - Typical compression ratio 1.5 – 2.0.
- RLE compression:
  - Removed pixels below background
  - Zeros and whites are run length encoded
- SLVS-EC and other high bandwidth sensor interface IP

USER APPLICATIONS

- Velociraptor HS cameras were used for ARIANE rocket launch recording
- Spinosaurus LX is widely used for 3D inspection in mobile phone production.
- TREX and Smilodon cameras are used in motion capture for medical and sports industry.
- Smilodon is used to track drones during wireless power delivery

FUTURE

- MIPI multihead PoE camera on Kria K24 SoM
- Deep learning acceleration possible. AMD Vivado includes several Deep Learning Units for implementation in FPGA logic.
- Other image processing algorithms according to customer specification
- Go beyond 10G Ethernet



THANK YOU !

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www.optomotive.com