

XPOSURE CAMERA

More than just a high speed linescan camera

600KHZ MULTI-LINESCAN CMOS CAMERA FOR INLINE INSPECTION

xposure camera is especially designed for high-speed inline-quality inspection. With in total 60 lines xposure camera is much more than a high-speed linescan camera. Each of the 60 lines can be read out individually. One line (monochrome) can be captured with 600kHz and three lines (RGB) with 200kHz. All 60 lines can be captured at frame rates up to 10kHz.

xposure camera offers single sensor multi-line-scan capabilities which opens unexpected capabilities for e.g. inline 3D surface analysis. Even more high-performance applications come into reach by adding for example computational imaging methods, which include correction of optical aberration, noise reduction, adaptive time delay integration (TDI) and dynamic range enhancement by employing multiple exposures. The xposure camera is an enabler for a novel embedded network of smart high-performance cameras:

- 60 x 2016 pixels
- High speed: 600kHz (mono), 200kHz (color)
- High dynamic range: > 53dB
- High signal to noise ratio: > 40dB
- Small size: 85 x 85 x 85 mm

HIGHLIGHTS

- Line-scan mode with up to 600kHz
- Areascan mode for easy mechanical adjustment
- 40 GigE Vision Ethernet Standard (QSFP with 4 x 10 GBit/s Ethernet)
- Large high-end FPGA (Altera Arria 10 SOC with Linux OS) allows customizable pre-processing, protocols or interfaces
- Cascading of cameras to form a network of cameras
- Cascading of trigger and sync signals (1 camera can act as a master)
- Newest FlexPrint technologies with 10 GHz, thus flexible mounting and flexible camera housings possible
- Customized IO boards inside the camera possible with same dimensions (e.g. CameraLink (mini), machine interfaces, LED lighting control)
- xposure enables new applications in high speed image processing

APPLICATION FIELDS

- Linescan and areascan
- Single Sensor Photometric Stereo*
- Single Sensor Lightfield*
- Multispectral*
- Optical Coherence Tomography (OCT)

* future options

SENSOR DATA

Parameter	MEASURED VALUES				
	463 nm	518nm	627nm	860nm	
Dynamic range	54.4	53.2	54.0	53.5	dB
Max. signal to noise ratio	41.4	40.8	41.2	41.0	dB
Dark noise	25,5	25.4	25.2	25.7	e-
Noise Equivalent Energy	33	29	24	32	pJ/cm ²
Camera gain	0.058	0.058	0.059	0.058	DN/e
Quantum efficiency	42.2	42.1	42.7	23.8	%
Saturation irradiance	32953	28642	30912	53141	ph/px
Nonlinearity	1.13	0.50	0.77	0.74	%

SPECIFICATIONS

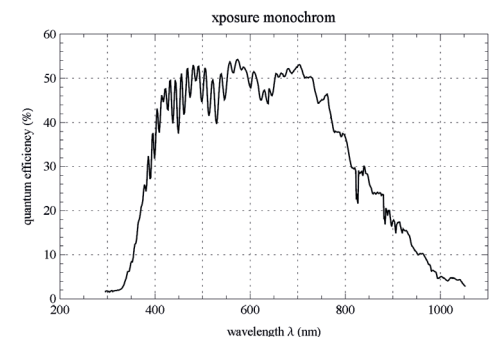
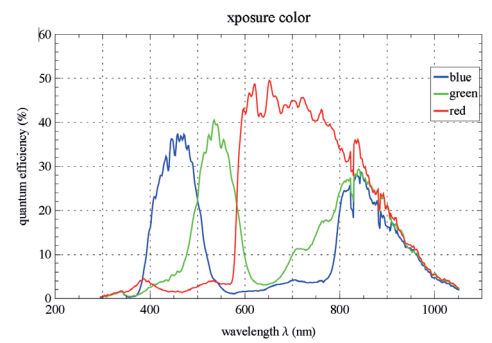
Pixels per Line	2016	plus 32 dark pixels/line
Pixel Size	9 x 9 μm ²	100% fill factor
Number of Lines	60	organized in 20 triples
Vertical Pitch	18 μm	
Line-rate Mono (max.)	600 kHz	Single line read out
Line-rate RGB (max.)	200 kHz	Tri-linear read out
Frame-rate (max.)	10 kHz	read out of all 60 lines
ADC's	600 kSamples / s	On-chip, column-parallel
Sensor Output	16 taps à 10 bit, 80 MHz	
Image Sensor Data Bandwidth	12 Gbit/s	

FEATURES

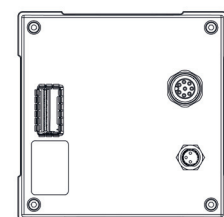
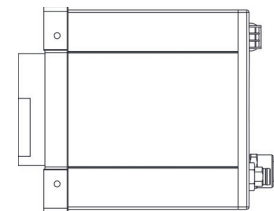
Dimensions	85 x 85 x 85 mm	without lens & lens adapter
Lens mount	M42x1	flange focal distance 6.50mm
Power	12–24 VDC	Binder M8, 3pol
Power Dissipation	max. 15 Watt - @12 VDC & Arria 10 SX270	
Trigger	2 trigger inputs 2 trigger outputs	Binder M12, 8pol
Operating Temp.	0°C ... 50°C	
Humidity	20% ... 80%, rel. non-condensing	
Interface	10GigE Vision (QSFP with 4x10 GBit/s)	
Dual-core ARM Cortex	Cortex A9 MPCore™ processor	

ADVANTAGES

- Sensor made in Germany
- Manufactured in own production
- Automotive certified
- Long term availability



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//01 Spectral Sensitivity

//02 Technical Drawings

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