

# FireCam-M



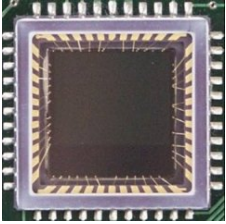
- DIGITAL FIREWIRE ◀
- HIGHSPEED-INTERFACE ◀
- 1.3 MEGAPIXEL ◀
- MONOCHROM - 3/4" - FORMAT ◀
- CMOS IMAGE SENSOR ◀
- 11-BIT DYNAMIC ◀
- 1 KHZ FRAME RATE ◀
- NOTEBOOK COMPATIBLE ◀



The FireCam-C is a high resolution 1.3 megapixel camera system with 11-bit dynamic, designed for various industrial and scientific applications. Because of the hot-plug compatible FireWire HighSpeed Interface, it is very easy to connect the FireCam-C to any computer which provides a standard OHCI IEEE1394 compatible interface (single-cable-connection). In particular, this offers the possibility of using a notebook as a very flexible and transportable image processing system. The user-interface provides the integration of additional features like an external trigger, external flash synchronisation etc. All camera functions like amplification, gamma, exposure time, ROIs can be adjusted by Software.

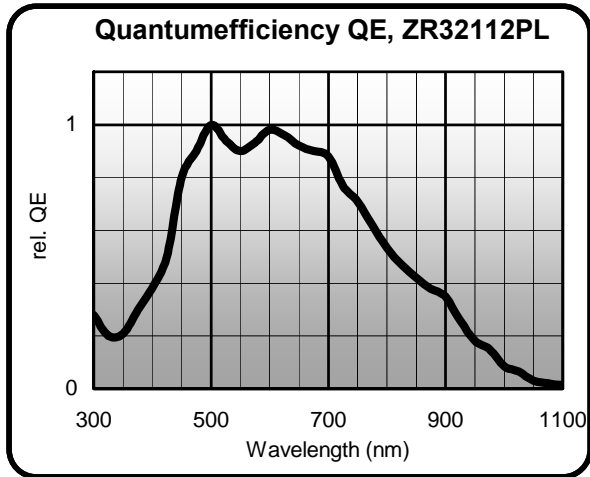
Features	
<b>High Sensitivity</b> ▶	High signal to noise ratio with $20e^-$ noise due to the signal processing and digitalization on the image sensor chip. Sensitivity from UV to close IR.
<b>11-bit Dynamic</b> ▶	The 10-bit digitalization of the logarithmic signal on the CMOS image sensor and the following expansion without loss of accuracy by the software results in an 11-bit dynamic for photometric measurements and low-contrast structures.
<b>Photometric Linearity</b> ▶	Proportionality of measured counts to incoming light intensity better than 2%, can be optimized to linearities $< 0.5\%$ with correction tables.
<b>High Resolution</b> ▶	1.3 megapixel 3/4" CMOS image sensor (9.6mm x 7.7mm; 12.3mm diagonal), 1280 x 1024 square pixel with a size of $7.5\mu\text{m} \times 7.5\mu\text{m}$ .
<b>External Timing</b> ▶	Asynchronous electronic integration time control by an external gate input. Exposure times from approximately 10ms to 400ms.
<b>FireWire Interface</b> ▶	Single-Cable-Connection with 400-Mbits/s due to FireWire-HighSpeed Interface. Compatible with every standard OHCI IEEE 1394 interface. Works easily with notebooks.
<b>Anti-Blooming Function</b> ▶	One characteristic of CMOS-image sensors is that blooming by overexposure, this means blooming from one overexposed pixel to adjacent pixels, is not possible.
<b>1 kHz Frame Rate</b> ▶	With the user-defined partial scan very high frame rates are possible at a simultaneous reduction of the memory requirements for recording of long image sequences.
<b>WinSIS-Software</b> ▶	WinSISlight for standard, WinSIS6 for WinXP/2000/NT/9x for complex measurement-applications control all camera functions and integration timing. The very user-friendly and intuitive handling, the unique opportunity of macro-recording (WinSIS6 only) and of course the very simple project creation, offer a fast realization of complex applications without long training periods. SDK for personal programming.

# FireCam-M



CMOS image sensor Zoran ZR32112PL

Specifications	
Image Sensor	Zoran ZR32112 PL
Sensor Type	CMOS
Sensor Format	4 : 3, 3/4"-image sensor
Image Size	9.6mm x 7.68mm, 12.3mm diagonal
Pixel Size	7.5µm x 7.5µm
Pixel Number	1280 (H) x 1024 (V)
Electron Capacity	40,000e <sup>-</sup>
Readout Noise, rms	20e <sup>-</sup>
Dynamic	2,000 : 1
Dark Current @ 25°C	800e <sup>-</sup> / pixel / s
Quantum Efficiency	> 30%, incl. Fill Factor
Partial Scan	user-defined
Blooming	not existent
Digitalization	10-bit, 1024 grayscales
Readout Frequency	16 MHz (10-bit) 24 MHz (8-bit)
Frame Rate	9.3 Hz, full resolution 1.2 kHz, 1280x8 image
Integration Time	10ms to 400ms
Optical Mount	c-mount
Mech. Dim. (WxHxD)	68x105x44mm
Weight	350g
Operational Temperature	+5 to +40°C



The quantum efficiency QE is defined as the percentage of the incoming photons, which generate an electronic charge.

Image Size H X V-	Frame Rate		Scanmode	
	10-bit	8-bit	ROI	Skip
1280 x 1024	9.3	13.9	-	-
1280 x 512	18.6	27.8	✓	1
1280 x 8	1190.0	1785.0	✓	1
640 x 512	16.1	24.1	-	2
640 x 480	19.6	29.4	✓	1
640 x 480	32.4	48.6	✓	2
640 x 4	2063.0	3094.0	✓	2
320 x 256	25.4	38.1	-	4
320 x 240	39.2	58.0	✓	1
320 x 240	110	162	✓	4
320 x 2	3278.0	4918.0	✓	4

Because of the programmable scanmode of the FireCam the frame rate can be flexible optimized depending on the image resolution. This is possible with the partial scan of any image area (ROI) and the skip of one or three lines and columns.

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