

**High Sensitive
Digital Color
Progressive Scan Camera**

 System: **IEEE1394a**
Baumer FWX14c

 Art. No: **OD105704**

- IEEE1394a (FireWire™) progressive scan CCD camera
- 1392 x 1040 pixel
- Outstanding color fidelity
- Ultra high sensitivity (EXview CCD technology)
- High quality slow scan mode for lowest readout noise
- Up to 15 full frames per second
- Binning and true partial scan function (ROI) for increased frame rates
- External synchronization via asynchronous trigger and flash sync function
- Integrated 8 MByte RAM for temporarily image data buffering
- Compact robust aluminum housing
- Industrial IEEE1394a connector
- Camera parameter in real-time programmable
- Powerful Baumer FCAM1394 driver (OHCI standard compliant) / Software Development Kit for Windows / Linux
- IEEE1394a interface
- User-friendly Baumer TWAIN compatible image capture and camera control software



shown lens needs to be ordered separately

1. Overview

Sensor	2/3" interline progressive scan CCD EXview technology
Shutter / readout mode	global shutter / progressive scan readout
Number of pixel	1392 x 1040
Scan area	9.0 mm x 6.7 mm
Pixel size	6.45 µm x 6.45 µm
Color filter	RGB Bayer mosaic
Operation modes	
Trigger mode	yes
Free running mode	yes, sequential shutter operation
Signal processing	real-time software programmable
Pixel clock	29.5 MHz fast scan / 14.75 MHz high quality (HQ) scan
A/D converter	12 bit
Exposure control (t _{exp})	total: 4 µsec .. 2 sec 4 µsec .. 65 msec: step 1 µsec 70 msec .. 2 sec: step 10 msec
Gain control	0 .. 20 dB
Offset (black level)	0 .. 255 LSB (12 bit)
Image data buffer	8 MByte
Image acquisition	
Data format	raw image data from camera

Technical specifications subject to change

Camera image format modes (see item 3)	Format (pixel)	Bit per pixel	Pixel clock MHz	Frames per sec. *)	t _{readout}	
Full frame	slow	1392 x 1040	8	14.75	7.5	133 msec
	fast		29.5	15	66 msec	
Binning 2x2	slow	696 x 520	8	14.75	15	66 msec
	fast		29.5	30	33 msec	
Binning 4x4	slow	348 x 260	8	14.75	30	33 msec
	fast		29.5	60	17 msec	
Partial scan function	yes, format freely programmable in all modes (binning on partial scan ok)					
Brightness correction function	optional in all binning modes					
Test pattern function	yes, in all modes					
Data quality	at 20 °C, gain = 1, exposure time = 32 msec, full frame mode, slow scan					
Readout noise	$\sigma < 0.5$ LSB (8 bit) typical					
Dynamic range	typical > 54 dB					
Optical interface	C-Mount					
Optical filter	Hoya CM500S option: dust protection or no filter					
Process interface functions						
Async. trigger	yes, trigger mode operation, software trigger and external trigger signal					
External flash sync	yes					
Software reset	yes, in free running mode, delay up to 133 msec					
Image data header	yes					
Electrical interface						
Data / control / power	standard single cable IEEE1394a / 6 pins option: screw lock type connector					
Digital input	1: trigger signal, opto decoupled, 3 V .. 14 V / 20 mA trailing edge **) min. trigger impulse length (t _{min}): 1 µsec max. trigger delay (t _{delay}): 4 µsec					
Digital output	1: flash sync signal, 12 V / 20 mA low active **)					
LED	green: power on / yellow: data transmission active					
Power consumption	approx. 3 Watt					
Environmental						
Storage temperature	-10 °C .. +70 °C					
Operating temperature	+5 °C .. +50 °C					
Humidity	10 % .. 90 % non condensing					
Housing	aluminum					
Dimensions	73 x 56 x 55 mm ³					
Weight	340 g					
IEEE1394a interface	OHCI standard compliant					
Software	Baumer FCAM1394 driver / SDK for Windows 2000 / Windows XP / Linux Kernel 2.4.>22, 2.6.xx Baumer TWAIN image capture and camera control software					

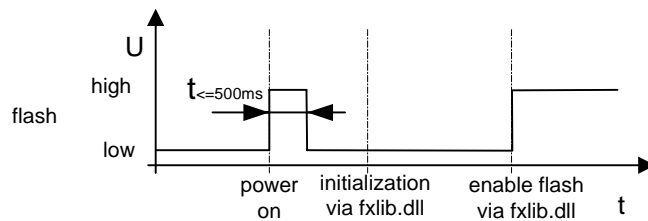
*) maximum frame rate in free running mode, effective frame rate depending on SDK image mode settings and set exposure time

**) can be inverted via software

2. Camera Factory Settings after Camera Start-Up

Camera factory settings after camera start-up	
Operation modes	free running mode
Signal processing	
Exposure control	32 msec
Gain control	factor 1 = 0 dB
Offset (black level)	0
Image acquisition	
Camera image format mode	mode ID = 0: full frame HQ (see item 3)
Partial scan function	not active
Electrical interface	
Flash sync signal	disabled, digital output set to low status *)

*) Electrical interface: flash sync signal



3. SDK Supported Image Formats

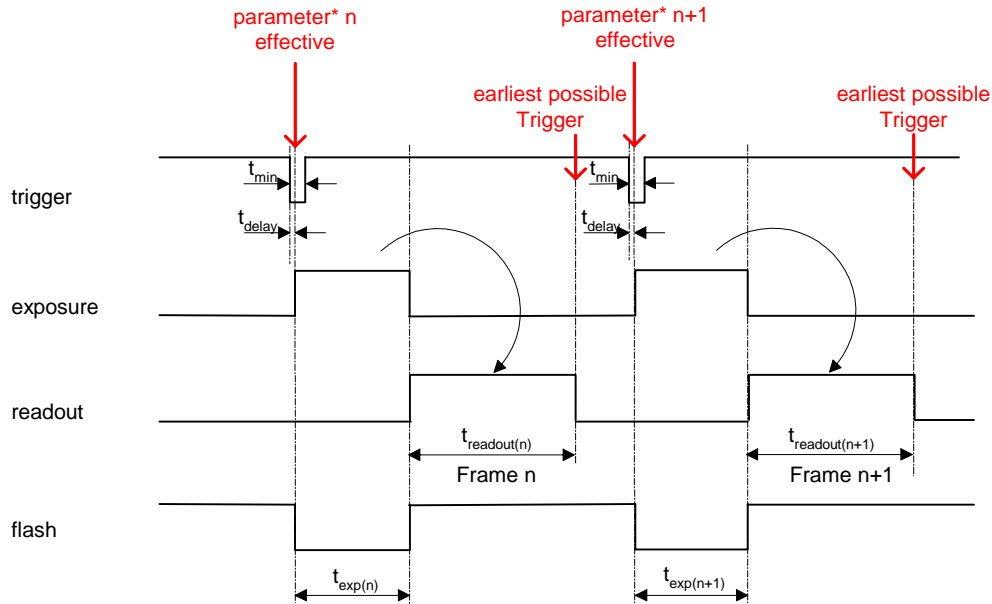
Camera name	FWX14c				
Camera mode	SDK image mode				
	Mode ID	Description	Image format	Color coding	Functions / State
Full Frame slow	0	Full Frame HQ	1392 x 1040	RawBayer8, Mono8, Color3x8	PS, T, F, Color
Full Frame fast	1	Full Frame	1392 x 1040	RawBayer8, Mono8, Color3x8	PS, T, F, Color
Binning 2x2 slow	2	Binning 2x2 HQ	696 x 520	RawMono8, Mono8	PS, T, F, BRC, Mono
Binning 2x2 fast	3	Binning 2x2	696 x 520	RawMono8, Mono8	PS, T, F, BRC, Mono
Binning 4x4 slow	4	Binning 4x4 HQ	348 x 260	RawMono8, Mono8	PS, T, F, BRC, Mono
Binning 4x4 fast	5	Binning 4x4	348 x 260	RawMono8, Mono8	PS, T, F, BRC, Mono

SDK - Software Development Kit
HQ - high quality
BRC - brightness correction
PS - partial scan
T - trigger
F - flash
Mono - monochrome mode
Color - color mode

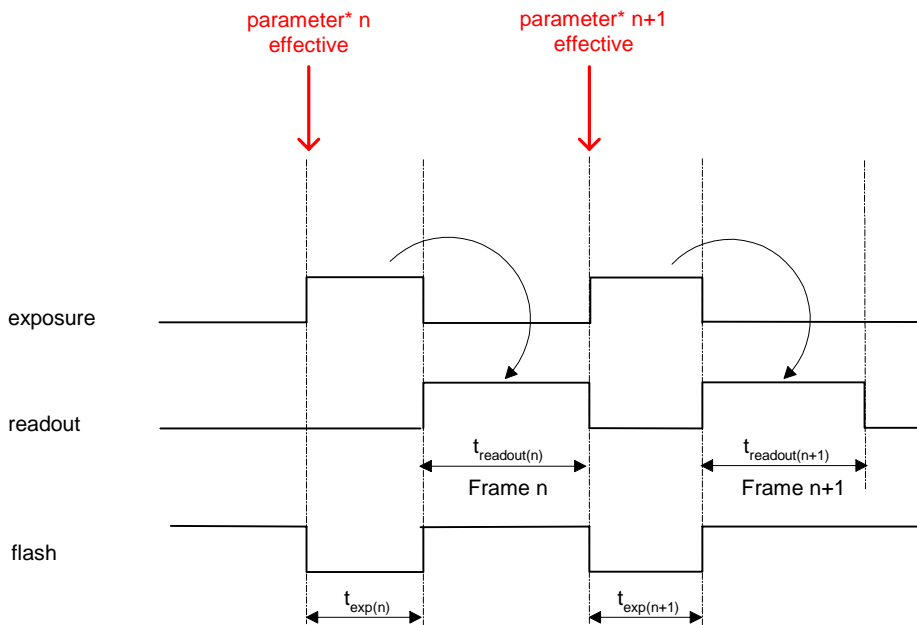
RawBayer8 - unmanipulated pixel data in Bayer filter pattern in 8 bit
RawMono8 - unmanipulated pixel data for monochrome camera modes in 8 bit
Color3x8 - software corrected image data for color camera modes in the color data arrangement RGB...RGB in 8 bit
Mono8 - software corrected image data for monochrome camera modes in 8 bit

4. Timing Operation Modes

Trigger Mode: sequential operation

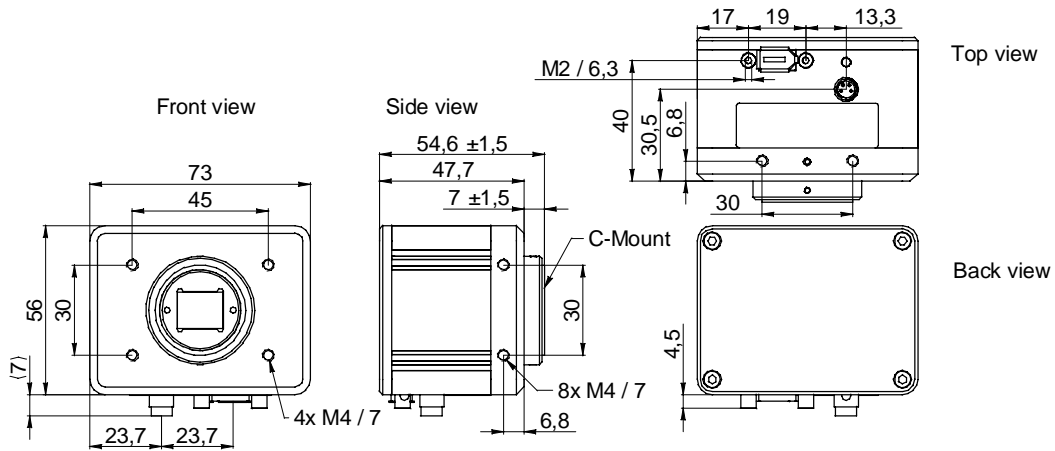


Free Running Mode: sequential operation

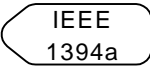



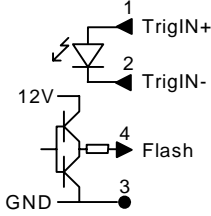
* image parameter: exposure time
offset
global gain
color gain
mode
partial scan

5. Housing



6. Connectors / Electrical Interfaces

IEEE1394a	Pin
 IEEE 1394a	1: Power 2: GND 3: TPB- 4: TPB+ 5: TPA- 6: TPA+

Trigger / Flash	Typ: Lumberg RSMESD 4pin.
	
Trigger / Flash cable wires color *): 1 = brown 2 = white 3 = blue 4 = black	

*) shielded trigger / flash cable needs to be used and ordered separately

End of Document