Baumer
Passion for Sensors

Technical Data
VEXU-24C
Digital Color Matrix Camera, 2.3 Megapixel, USB 3.0
Article No. 11151568
Firmware Revision 1.0

GiGE VISION   GEN<i>CAM   CE   RoHS REACh compliant

Sensor Information

Model Name	Sony IMX249
Type	1/1.2" progressive scan CMOS
Shutter	Global Shutter
Resolution	1920 x 1200 pixels
Scan Area	11.25 mm x 7.03 mm
Pixel Size	5.86 µm x 5.86 µm

Data Quality
@ 20 °C, gain = 1, exposure time = 4 msec

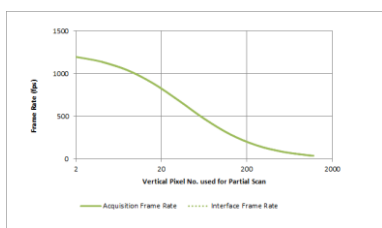|	
Dark Noise (σ)	7.9 e- typical
Saturation	32000 e- typical
Dynamic Range	71 dB typical
SNR	45 dB typical
Quantum efficiency η	57 % @ 465 nm, 62 % @ 536 nm, 47 % @ 631 nm typical

Acquisition

Resolution	1920 px x 1200 px
Acquisition Frame Rate	38 fps | $t_{readout}$ = 25.8 msec (max. Res. Full Frame) @ 12 bit[1]

Interface Frame Rate (depends on used USB interface performance)	Format	Resolution	max. Frame Rate (@ Trigger Mode)
	Full Frame	1920 x 600	38 fps
	Binning 2x2	960 x 600	38 fps
	Binning 2x1	960 x 1200	38 fps
	Binning 1x2	1920 x 600	38 fps

Pixel Formats	BayerRG8, BayerRG12
Partial Scan	True Partial Scan with increasing Frame Rate on Y direction, Region of Interest (ROI) arbitrary Width: minimum 16, increment 16 Heigth: minimum 4, increment 4
Adjustable Acquisition Frame Rate	Off or Off or 0.01 … 1200 Hz
Acquisition Mode	Continuous, Single Frame and Multi Frame
Acquisition Status	AcquisitionActive, AcquisitionTrigger Wait
Exposure Mode	Timed

Image Pre-Processing

Analog Controls	Exposure Time (57 µsec … 60 sec | Step Size 1 µsec) Gain (0…48 dB), Offset (0 ... 255 LSB | 12 bit)
Color Models	Raw Bayer
Binning Horizontal	1 or 2
Binning Vertical	1 or 2
Image Flipping	no
Defect Pixel Correction	via Defect Pixel List with up to 512 Pixel Coordinates

Process Synchronization

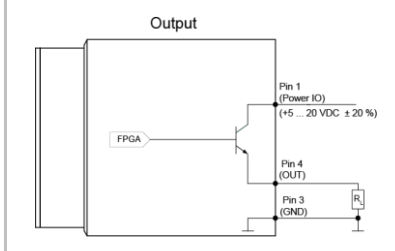|	
Trigger Mode	Off (Free Running), On (Trigger)
Trigger Overlap Type	Readout
Trigger Sources	Hardware (Line0), Software or Off fixed Trigger Delay out of $t_{readout}$: [1] 46 µsec @ 12 bit max. Trigger Delay during $t_{readout}$: [1] 62.5 µsec @ 12 bit
Trigger Delay	-
External Flash Sync	via Exposure Active $t_{delay\ flash} \leq 3$ µsec, $t_{duration} = t_{exposure}$

Sensor Graph: Relative Response

IMX249
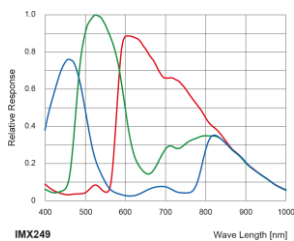
Frame Rates / Partial Scan
(Measured at Mono8/BayerRG8-Format)

Digital Output

[1] Sensor readout, different from pixel format

Digital Input	
Input	

| Trigger Mode: Start up time and valid Trigger | |
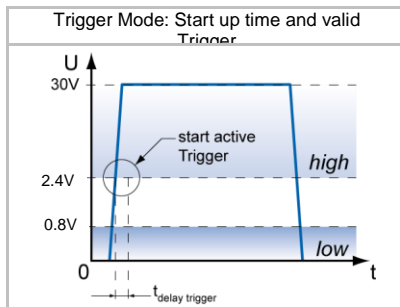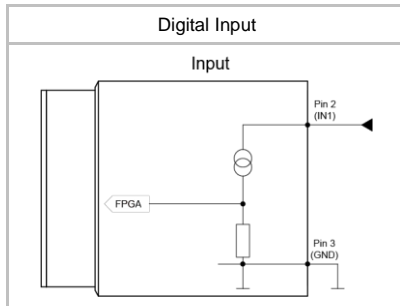
Digital I/Os

Lines	Input: Line 0, Output: Line1
Output Sources	Off, ExposureActive
Line Debouncer	Low and high signal separately selectable
	Debouncing Time 0 … 5 msec, Step Size: 1 µsec

Memory

Image Buffer	no image buffer
	no image buffer (Trigger Mode) / no (Free Running Mode)
Non-volatile Memory	128 kb

Interface Data

Interface	USB3.0 (5000 Mbits/sec)
USB Vendor ID / Product ID	0x2825 / 0x127

USB 3 Vision® Features

Events Transmission via Asynchronous Message Channel	-
Frame Counter	up to 2^{32}
Payload Size	0 … 4608000 Byte
Timestamp	64 bit
USB Vision	v1.0.1

Interfaces and Connectors

Data and Power Interface	USB 3.0	Transfer Rate 5000 Mbits/sec	
	USB 2.0	-	
	Connector:	USB 3.0 Micro B	
	Pin Assignment:	VBUS	MicB_SSTX-
		D-	MicB_SSTX+
		D+	GND_DRAIN
		ID	MicB_SSRX-
		GND	MicB_SSRX+
Process Interface	Connector:	M8/4-pin (SACC-DSI-M 8MS-4CON-L180)	
	Assignment:	1 - VCC (Out)	3 - GND (IN)
		2 - IN+	4 - OUT

Caution

⚠

* Note I/Os: Ground loops are to be avoided and can lead to destruction of the device.

Optical Data

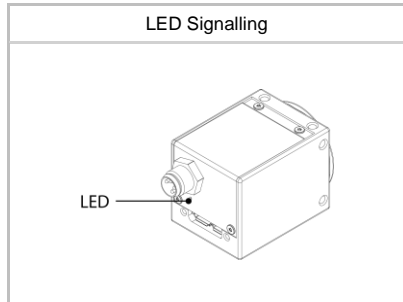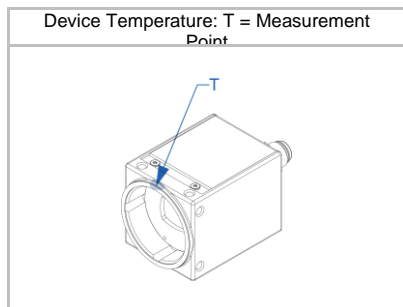| Lens Mount	CS-Mount
Optical Filter	IR cut filter

Mechanical Data

Housing	Zinc die casting, nickel-chrome-plated,
	IP40 (with mounted lens and USB 3.0 cable)
Dimensions	

Weight	90 g

Pin Assignment Data Interface

Pin Assignment Process Interface (on camera side)

wire colors on connecting cables (ordered separately)			
1	Brown	2	White
3	Blue	4	Black

Device Temperature: T = Measurement Point
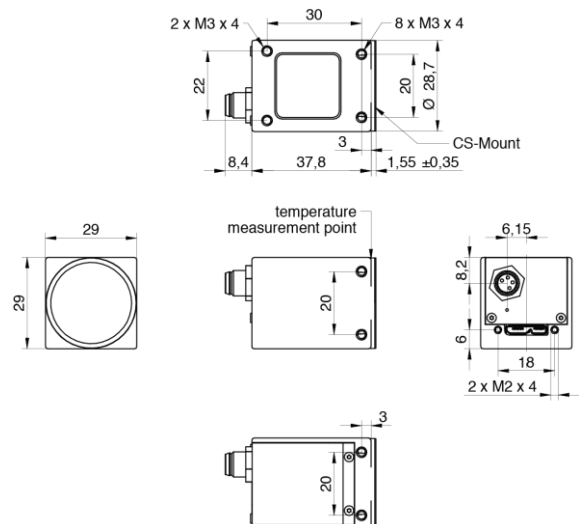
LED Signalling
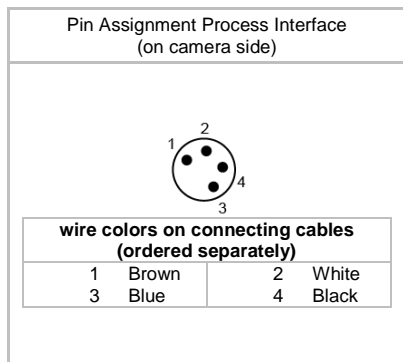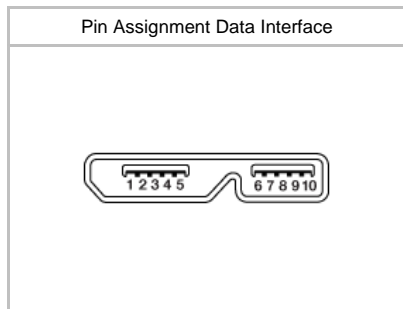
Environmental Data

Storage Temperature	-10 °C … + 70 °C
Operating Temperature [*)]	+5 °C … +65 °C @ T = Measurement Point Ambient temperature above 50 °C requires heat dissipation measures
Humidity	10 % … 90 % non-condensing

[*)] the maximum temperature for Sony sensor characteristics (sensor performance) are guaranteed up to °C @ Measurement Point

LED Signalling

LED	Green flash	Power on, no link active
	Green	Link active USB 3.0
	Red	Error
	Yellow	Sensor Readout activity
	Red flash	Update

Electrical Data

Power Supply (ext.)	bus powered via USB3.0 interface
Power Consumption	1.5 W @ 38 fps (Factory Setting "Default")
Digital Input	direct, without optocoupler $U_{IN(low)}$: 0.0 … 0.8 VDC $U_{IN(high)}$: 3.3 … 30 VDC I_{IN} : <10 mA min. Impulse Length: 2.0 µsec
Digital Output	direct, without optocoupler U_{EXT}: 5…30 V DC I_{OUT}: max. 50 mA t_{ON} = typ. 1.5 µsec t_{OFF} = typ. 40 µsec
Caution ⚠	* The digital I/Os are not potential-free and do not have an overrun cut-off. Incorrect wiring (overvoltage, undervoltage or voltage reversal) can lead to defects in the electronic system. Ground loops are to be avoided and can lead to destruction of the device.

Conformity

Conformity	CE, RoHS, REACH
KC Registration No. / Date	- / -
MTBF	- / - T = Measurement Point

GenICam™ Features

Timer	-	
User Sets	Factory Settings:	UserSet0 (read only)
	Freely Programmable:	UserSet1
	Parameters:	any user definable Parameter
Acquisition Abort	Delay up to 25.77 msec	
SFNC Version	v2.1	

Factory Settings after Start-Up

Trigger Mode	Off (Free Running)
Analog Controls	Exposure Time: 4 msec, Gain: 0 dB, Offset: 0
Pixel Format	BayerRG8
Partial Scan	Off
Acquisition Frame Rate	-
Timer	-
Defect Pixel Correction	ON
Fixed Pattern Noise Correction	-
Digital Input	Line0, invert = false
Digital Output	Line1, invert = false, line source = Off
GPIO 1/2	-
TriggerSource	Off

Partial Scan @ FullFrame, min Exposure, Mono8 or BayerRG8

	Resolution	max. fps acquisition	max. fps interface [2]
Full HD	1920 x 1080	42	43
SXGA	1280 x 1024	45	45
XGA	1024 x 768	59	59
SVGA	800 x 600	75	75
VGA	640 x 480	92	92
CIF	352 x 288	147	147
QCIF	176 x 144	263	263
LineScan	1920 x 1024	45	45
	1920 x 512	87	87
	1920 x 256	163	163
	1920 x 128	289	289
	1920 x 64	470	470
	1920 x 32	685	685
	1920 x 16	888	887
	1920 x 8	1043	4041
	1920 x 4	1142	1138
	1920 x 2	1200	1996
	1920 x 1		-

[2] depends on the used interface

VEXU-24C
27.08.2018