



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	68% @ 536 nm typical

Acquisition

Resolution	1920 px x 1200 px
Acquisition Frame Rate	38 fps $t_{\text{readout}} = 25.8 \text{ msec}$ (max. Res. Full Frame) @ 12 bit ¹⁾
Interface Frame Rate	Format Resolution max. Frame Rate (depends on used USB interface performance)
	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	Mono8, Mono12
Partial Scan	True Partial Scan with increasing Frame Rate on Y direction, Region of Interest (ROI) arbitrary Width: minimum 16, increment 16 Height: minimum 2, increment 2

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

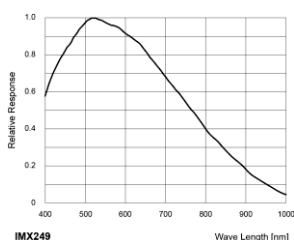
Image Pre-Processing

Analog Controls	Exposure Time (57 μsec ... 60 sec Step Size 1 μsec) Gain (0...48 dB), Offset (0 ... 255 LSB 12 bit)
Color Models	Mono
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

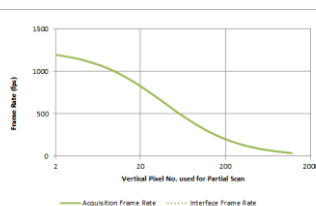
Process Synchronization

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 $t_{\text{delay flash}} \leq 3 \mu\text{sec}$, $t_{\text{duration}} = t_{\text{exposure}}$

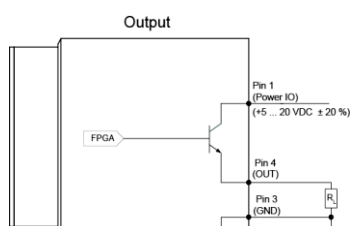
Sensor Graph: Relative Response



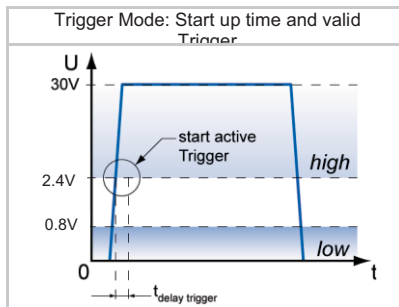
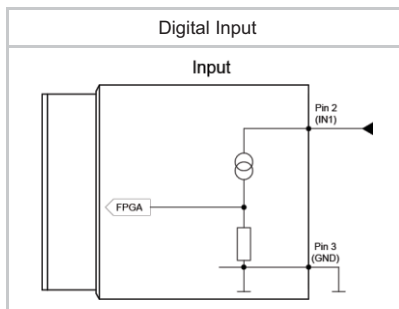
Frame Rates / Partial Scan
(Measured at Mono8/BayerRG8-Format)



Digital Output



¹⁾ Sensor readout, different from pixel format



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 / 0x126

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 USB 2.0	Transfer Rate 5000 Mbits/sec
	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.



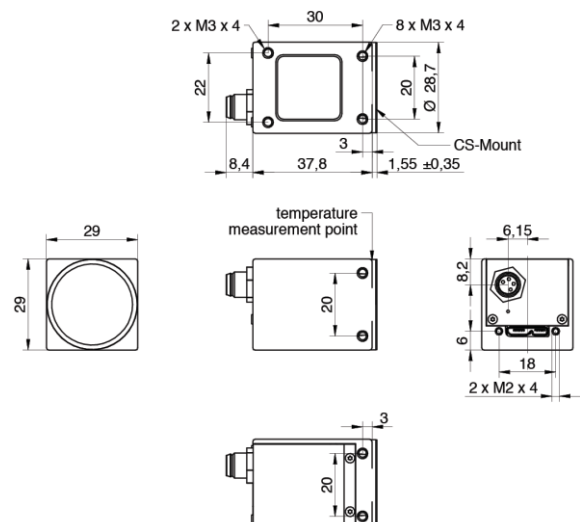
Optical Data

Lens Mount	CS-Mount
Optical Filter	-

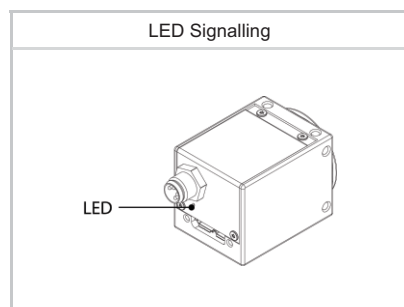
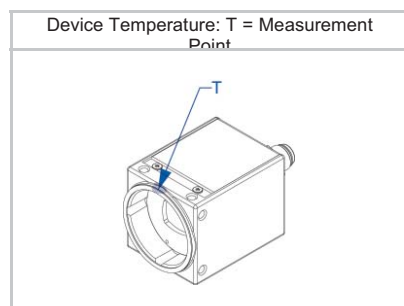
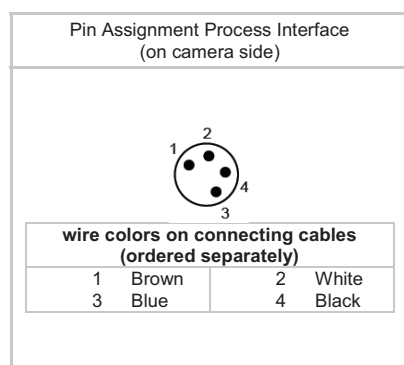
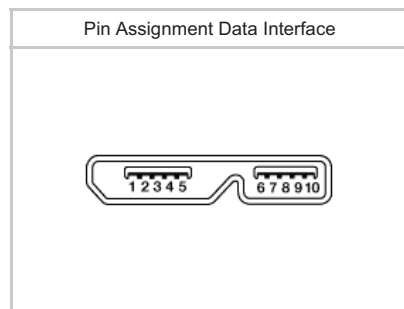
Mechanical Data

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



Weight	90 g
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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	Mono8
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	264
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	684
	1920 x 16	888	886
	1920 x 8	1043	1040
	1920 x 4	1142	1138
	1920 x 2	1200	1995
	1920 x 1		-

²⁾ depends on the used interface

Distribution in the UK & Ireland



**Characterisation,
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