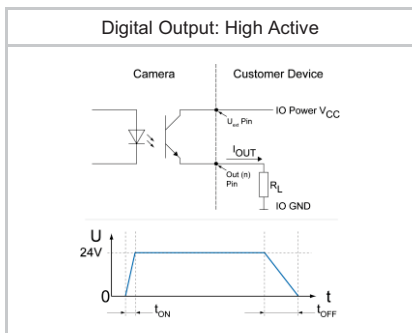
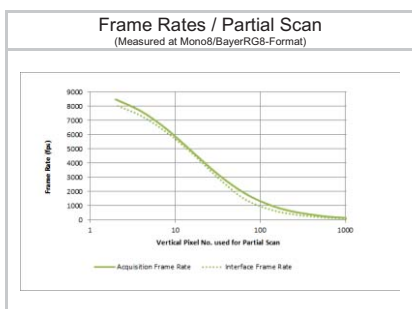
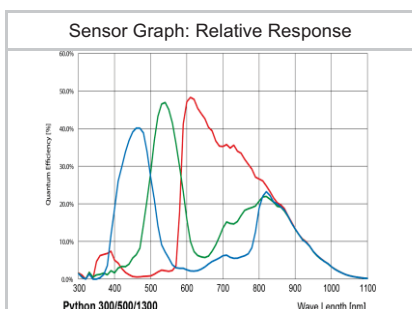




¹⁾ Sensor readout, different from pixel format

²⁾ depends on the used interface

GigE
 VISION

GEN*i*CAM


Sensor Information

Model Name	ON Semiconductor Python 1300
Type	1/2" progressive scan CMOS
Shutter	Global Shutter
Resolution	1280 × 1024 pixels
Scan Area	6.14 mm x 4.92 mm
Pixel Size	4.8 µm x 4.8 µm

Data Quality

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

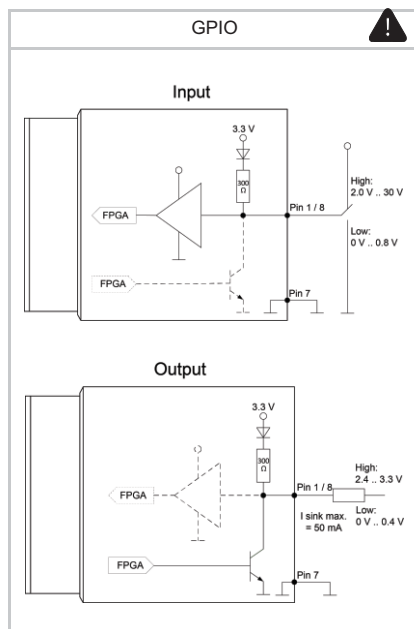
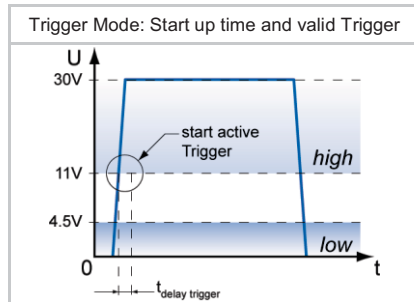
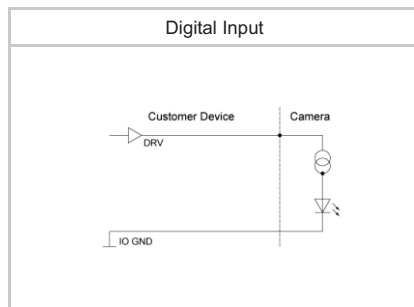
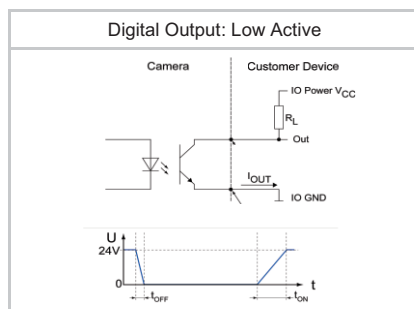
Dark Noise (σ)	10 e- typical
Saturation	7300 e- typical
Dynamic Range	57 dB typical
SNR	39 dB typical
Quantum efficiency η	40 % @ 465 nm, 43 % @ 536 nm, 46 % @ 631 nm typical

Acquisition

Resolution	1280 px x 1024 px		
Interface Frame Rate (depends on used interface performance)	Format	Resolution	max. Frame Rate (@ Trigger Mode) ²⁾
	Full Frame	1280 x 1024	94 fps
	Binning 2x2	640 x 512	148 fps
	Binning 2x1	640 x 1024	148 fps
	Binning 1x2	1280 x 512	148 fps
Acquisition Frame Rate ¹⁾ (Burst Mode)	148 fps t _{readout} = 6.74 msec (max. Res. Full Frame) @ 10 bit		
Pixel Formats	BayerRG8, BayerRG10 Mono8, Mono10, RGB8, BGR8		
Partial Scan	True Partial Scan with increasing Frame Rate on X and Y direction, Region of Interest (ROI) arbitrary Width: minimum 24, increment 8 Height: minimum 4, increment 4		
Adjustable Acquisition Frame Rate	Off or Off or 0,01 ... 9174 Hz		
Acquisition Mode	Continuous, Single Frame and Multi Frame		
Acquisition Status	AcquisitionActive, AcquisitionTrigger Wait		
Exposure Mode	Timed		
Readout Mode	Overlapped, Sequential		

Image Pre-Processing

Analog Controls	Exposure Time (20 µsec ... 1 sec Step Size 1 µsec) Gain (0 ... 12 dB), Offset (0 ... 63 LSB 10 bit)
Gamma Correction	Gamma (0.1 ... 2 available if LUT is enabled)
LUT	Luminance (12 bit)
Color Models	Mono, Raw Bayer, RGB and BGR
Color Processing	Integrated color processor for high quality color calculation
Color Adjustment	Manual White Balance Automatic White Balance (Once or Continuous)
Color Enhancement	Color Transformation to sRGB color space by optimized Matrix for 6500 K, 3000 K Lightsource or User defined Matrix
Color Tolerance	-
Binning Horizontal	1 or 2
Binning Vertical	1 or 2
Image Flipping	Horizontal, vertical
Defect Pixel Correction	via Defect Pixel List with up to 512 Pixel Coordinates
Fix Pattern Noise	yes
Correction	



¹⁾ Sensor readout, different from pixel format

Process Synchronization

Trigger Mode	Off (Free Running), On (Trigger)
Trigger Overlap Type	Readout
Trigger Sources	Hardware (Line0,1,2), Software, All, ActionCMD (Action 1) or Off fixed Trigger Delay out of t _{readout} : ¹⁾ 6 μsec @ 10 bit max. Trigger Delay during t _{readout} : ¹⁾ 12 μsec @ 10 bit
Trigger Delay	0 ... 2 sec, Tracking and buffering of up to 256 triggers
External Flash Sync	via Exposure Active t _{delay flash} ≤ 3 μsec, t _{duration} = t _{exposure}

Digital I/Os

Lines	Input: Line 0, Output: Line3, GPIO: Line 1, Line 2
Output Sources	Off, ExposureActive, Timer1, ReadoutActive, UserOutput 1-3 and TriggerReady
Line Debouncer	Low and high signal separately selectable Debouncing Time 0 ... 5 msec, Step Size: 1 μsec

Memory

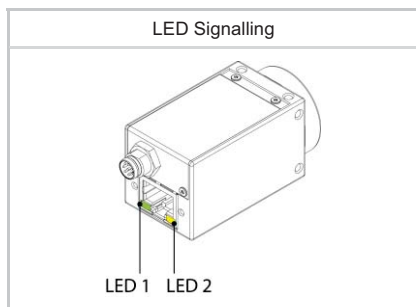
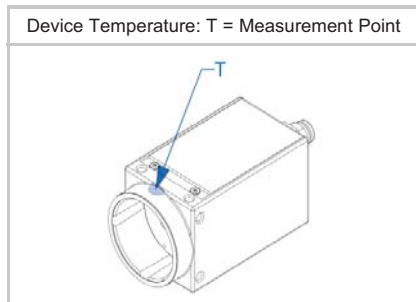
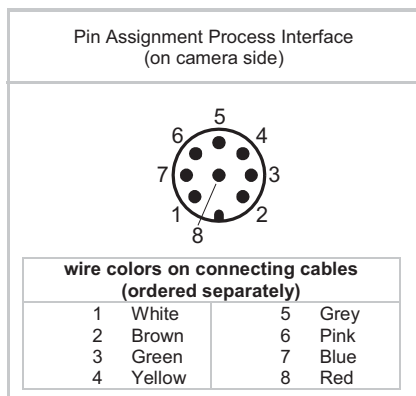
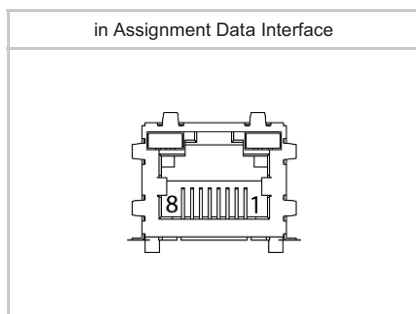
Image Buffer	60 MB 16 Images (Trigger Mode) / 1 Image (Free Running Mode)
Non-volatile Memory	128 kb

Network Interface Data

Interface	Gigabit Ethernet 1000BASE-T 1000 Mbits/sec Fast Ethernet 100 BASE-T 100 Mbits/sec
Ethernet IP Configuration	Persistent IP, DHCP, LLA
Packet Size	576 ... 9000 Byte, Jumbo Frames supported

GigE Vision® Features

Events	DeviceTemperatureStatusChanged, EventLost, ExposureEnd, ExposureStart, FrameEnd, FrameStart, FrameTransferSkipped, Error, GigEVisionHeartbeatTimeout, Line0..3 FallingEdge, Line0..3 RisingEdge, PrimaryApplicationSwitch, TransferBufferFull, TransferBufferReady, TriggerOverlapped, TriggerReady, TriggerSkipped
Action CMD	yes, Action 1 for Trigger
Frame Counter	up to 2 ³²
Payload Size	0 ... 3932360 Byte
Timestamp	64 bit, resolution in nsec, increment = 8
Packet Delay	0 .. 2 ³² - 1 nsec
Packet Resend	Resend Buffer: 60 MB (16 Images)
GigE Vision	v2.0 (v1.2 backward compatible)



Interfaces and Connectors

Data and Power Interface	Gigabit Ethernet	Transfer Rate	1000 Mbits/sec
	Fast Ethernet	Transfer Rate	100 Mbits/sec
Connector: 8P8C Modular Jack (RJ45), screw lock type			
Assignment:	1 - MX1+	2 - MX1-	
	3 - MX2+	4 - MX3+	
	5 - MX3-	6 - MX2-	
	7 - MX4+	8 - MX4-	
Process Interface	Connector: M8/8-pin (SACC-DSI-M8MS-8CON-M8-L180)		
	Assignment: 1 - GPIO (Line2) 2 - Power Vcc 3 - IN1 (Line0) 4 - GND IN1 5 - Power VCC OUT 6 - OUT1 (Line3) 7 - GND (Power, GPIO) 8 - GPIO (Line1)		

Caution



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

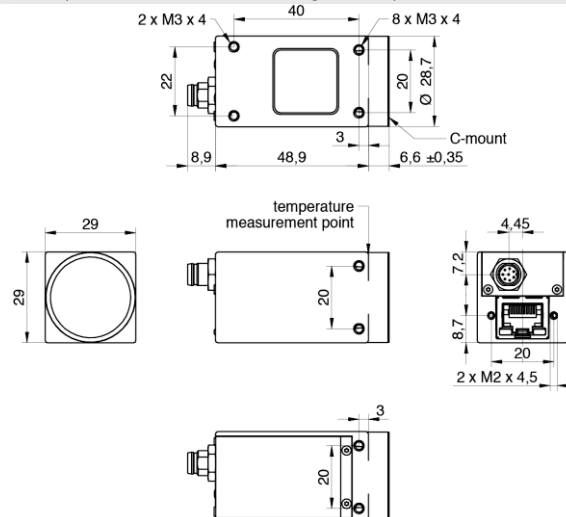
Optical Data

Lens Mount	C-Mount
Optical Filter	IR cut filter

Mechanical Data

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



Weight	120 g
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Environmental Data

Storage Temperature	-10 °C ... + 70 °C
Operating Temperature	+5 °C ... +65 °C @ T = Measurement Point or +5 °C ... +75 °C @ internal Temperature Sensor Ambient temperature above 34 °C requires heat dissipation measures.
Int. Temperature	yes, accuracy:
Sensor	±1 °C (typ) 0 °C ... +85 °C
Humidity	10 % ... 90 % non-condensing

LED Signalling

LED	Green flash	RX active
	Green	Link ON
	Yellow	Error
	Yellow flash	TX active

Electrical Data

Power Supply (ext.)	VCC: 12 ... 24 V DC $\pm$ 20% I: 103 ... 208 mA
Power over Ethernet	Class 0 device VCC: 36 ... 57 V DC I: 67 mA @ 48 VDC
Power Consumption	approx. 2.5 W @ 12VDC and 94 fps approx. 3.2 W @ 48 VDC (PoE) and 94 fps (Factory Setting "Default")
Digital Input	Optocoupler $U_{IN(low)}$: 0.0 ... 4.5 VDC $U_{IN(high)}$: 11.0 ... 30.0 VDC I_{IN} : 3.0 ... 10.0 mA min. Impulse Length: 2.0 μ sec
Digital Output	Optocoupler U_{EXT} : 5 ... 30 V DC I_{OUT} : max. 50 mA t_{ON} = typ. 3 μ sec t_{OFF} = typ. 40 μ sec
GPIO	direct, without optocoupler
GPIO used as Input:	$U_{IN(low)}$: 0.0 ... 0.8 VDC $U_{IN(high)}$: 2.0 ... 30.0 VDC min. Impulse Length: 2.0 μ sec
GPIO used as Output:	$U_{Out(low)}$: 0.0 ... 0.4 VDC ($I_{sink\ max}$: 50 mA) $U_{Out(high)}$: 2.4 ... 3.3VDC (I_{max} : 1 mA)
Caution	* The General Purpose I/Os (GPIOs) 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
KC Registration No. / Date	MSIP-REI-BkR-VCXG-13M / 02.05.2017
MTBF	63 years @ T = 45 °C / 40 years @ T = 60 °C T = Measurement Point

GenlCam™ Features

Short Exposure Range	-
Timer	Timer Selector: Timer 1 TimerTriggerSource: Line0, SoftwareTrigger, ExposureStart, ExposureEnd, FrameTransferSkipped, TriggerSkipped, Action 1 and Off TimerDelay: 0 μ sec ... 2 sec, Step Size: 1 μ sec TimerDuration: 4 μ sec ... 2 sec, Step Size: 1 μ sec
Counter	Counter Selector: Counter 1, Counter 2 CounterValue: 0 ... 65535 Counter Event Source: Counter1End or Counter2End, ExposureActive, FrameTransferSkipped, FrameTrigger, TriggerSkipped and Off Counter Reset Source: Counter1End, Counter2End, Line0 and Off
Sequencer	Sequencer Characteristics: up to 128 sets, up to 4 possible pathes for triggered set transitions, 6 trigger sources: Counter1End, Counter2End, ExposureActive, Line0, ReadoutActive, Timer1End Sequencer Parameters for Exposure, Gain, Trigger, ROI and Output: ExposureTime, CounterDuration, CounterEventActivation, CounterEventSource, CounterResetSource, ExposureMode, ExposureTime, Gain, Height, OffsetX, OffsetY, TriggerMode, UserOutputValue, UserOutputValueAll, Width

GenICam™ Features

User Sets	Factory Settings: UserSet0 (read only) Freely Programmable: UserSet1, UserSet2, UserSet3 Parameters: any user definable Parameter
Acquisition Abort	Delay up to 6.8 msec
Chunk Data	yes, Chunk Selector: Binning, Black Level, DeviceTemperature, ExposureTime, FrameID, Gain, Height, Image, ImageControl, LineStatusAll
Device Temperature	InHouse Event generation for Normal to High, High to Exceeded and Exceeded to Normal Exceeded (no image transfer) = max. internal temperature sensor + 1 °C
Device Link Throughput Limit	yes, up to max. Device Link Speed
SFNC Version	v2.3

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	Off
Timer/Counter/Sequencer	Off
Defect Pixel Correction	ON
Fixed Pattern Noise Correction	ON
Digital Input	Line0, invert = false
Digital Output	Line3, invert = false, line source = Off
GPIO 1/2	Line1, Line2, invert = false, LineMode = Input
TriggerSource	All

Partial Scan @ FullFrame, min Exposure, Mono8 or BayerRG8

	Resolution	max. fps acquisition	max. fps interface ²⁾
SXGA	1280 x 1024	148	94
XGA	1024 x 768	244	157
SVGA	800 x 600	391	257
VGA	640 x 480	595	402
CIF	352 x 288	1574	1215
QCIF	176 x 144	2881	2879
LineScan	1280 x 1024	148	94
	1280 x 512	292	188
	1280 x 256	566	389
	1280 x 128	1070	751
	1280 x 64	1922	1489
	1280 x 32	3204	2997
	1280 x 16	4781	4781
	1280 x 8	6357	6591
	1280 x 4	7614	7614
	1280 x 2	8451	8449
	1280 x 1	-	-

²⁾ depends on the used interface

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