

### Sensor Information

Model Name	Sony IMX265 Gen2
Type	1/1.8" progressive scan CMOS
Shutter	Global Shutter
Resolution	2048 x 1536 pixels
Scan Area	7.06 mm x 5.29 mm
Pixel Size	3.45 $\mu\text{m}$ x 3.45 $\mu\text{m}$

### Data Quality

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

Dark Noise ( $\sigma$ )	2 e- typical
Saturation	9500 e- typical
Dynamic Range	71 dB typical
SNR	40 dB typical
Quantum efficiency $\eta$	67% @ 536 nm typical

### Acquisition

Resolution	2048 px x 1536 px		
Interface Frame Rate (depends on used interface performance)	Format	Resolution	max. Frame Rate (@ Trigger Mode) <sup>2)</sup>
	Full Frame	2048 x 1536	39 fps
	Binning 2x2	1024 x 768	56 fps
	Binning 2x1	1024 x 1536	56 fps
	Binning 1x2	2048 x 768	56 fps
Acquisition Frame Rate <sup>1)</sup> (Burst Mode)	56 fps   $t_{\text{readout}} = 17.8 \text{ msec}$ (max. Res. Full Frame) @ 12 bit		
Pixel Formats	Mono8, Mono10, Mono12, Mono12p		
Partial Scan	True Partial Scan with increasing Frame Rate on Y direction, Region of Interest (ROI) arbitrary Width: minimum 16, increment 16 Height: minimum 1, increment 1		
Adjustable Acquisition Frame Rate	Off or Off or 0,01 ... 65535 Hz		
Acquisition Mode	Continuous, Single Frame and Multi Frame		
Acquisition Status	AcquisitionActive, AcquisitionTrigger Wait		
Exposure Mode	Timed		
Readout Mode	Overlapped, Sequential		

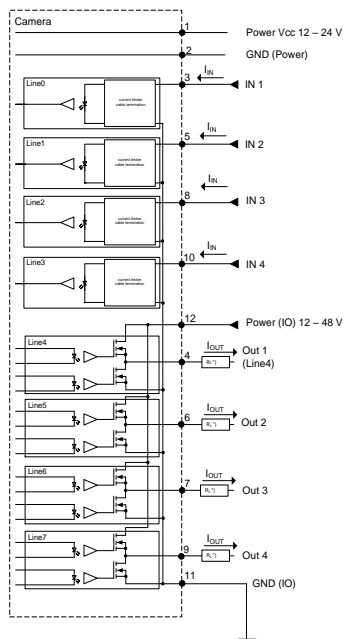
### Image Pre-Processing

Analog Controls	Exposure Time (1 $\mu\text{sec}$ ... 60 sec   Step Size 1 $\mu\text{sec}$ ) Gain (0...48 dB), Offset (0 ... 255 LSB   12 bit)
Auto Function	-
LUT	Luminance (12 bit)
Color Models	Mono
Color Processing	-
Color Adjustment	-
Color Enhancement	-
Color Tolerance	-

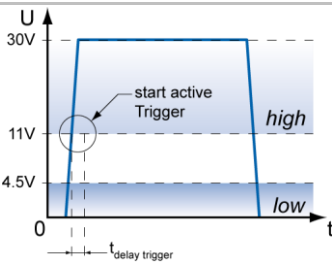
<sup>1)</sup> Sensor readout, different from pixel format

<sup>2)</sup> depends on the used interface

### Digital Input / Output: principle circuit diagram



### Trigger Mode: Start up time and valid Trigger



## Image Pre-Processing

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 Correction	-

## Process Synchronization

Trigger Mode	Off (Free Running), On (Trigger)
Trigger Overlap Type	Readout
Trigger Sources	Hardware (Line0, 1, 2, 3), Software, Action CMD (Action 1), All or Off fixed Trigger Delay out of t <sub>readout</sub> : <sup>1)</sup> 66,7 µsec @ 12 bit max. Trigger Delay during t <sub>readout</sub> : <sup>1)</sup> 73,1 µsec @ 12 bit
Trigger Delay	0 ... 2 sec, Tracking and buffering of up to 128 triggers
External Flash Sync	via Exposure Active t <sub>delay flash</sub> ≤ 3 µsec, t <sub>duration</sub> = t <sub>exposure</sub>
Encoder Function	yes, via Counter and Trigger Source
PTP Function	yes, Master or Slave (IEEE 1588)

## Digital I/Os

Lines	Input: Line 0 .. 3, Output: Line 4 .. 7, GPIO: no
Output Sources	Off, ExposureActive, Timer1, ReadoutActive, UserOutput 1-3 and TriggerReady
Output Line Mode	yes, Tri-State, PushPull, OpenDrain, OpenSource
Output PWM function	yes, Line 4 .. 7 PWM Mode: Off, One Pulse, FixedFrequency PWM feature: PWMDuration, PWMDutyCycle Configuration Mode for lightning protection: MaxPWMDuration, MaxPWMDutyCycle
Line Debouncer	Low and high signal separately selectable Debouncing Time 0 ... 5 msec, Step Size: 1 µsec

## Memory

Image Buffer	72 MB 8 Images (Trigger Mode) / 1 Image (Free Running Mode)
Non-volatile Memory	128 kb

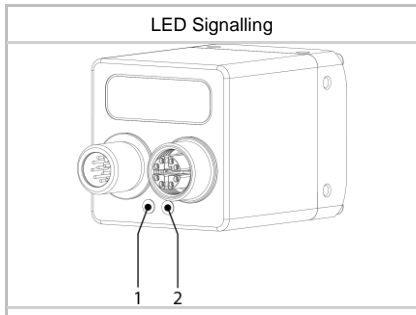
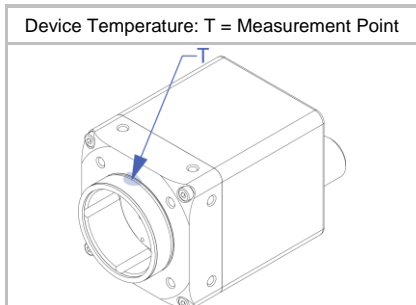
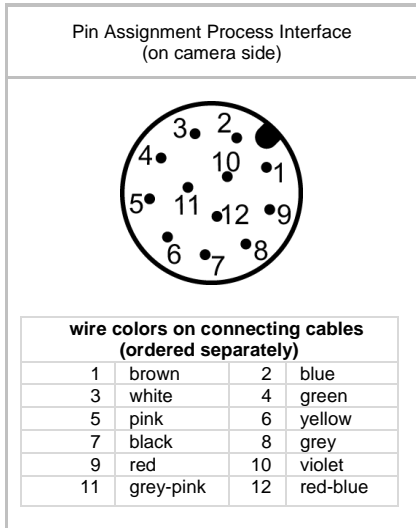
## Network Interface Data

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 Transmission via Asynchronous Message Channel	DeviceTemperatureStatusChanged, EventLost, ExposureEnd, ExposureStart, FrameEnd, FrameStart, FrameTransferSkipped, GigE VisionError, GigE VisionHeartbeatTimeOut, PrimaryApplicationSwitch, Line0..7 FallingEdge, Line0..7 RisingEdge, TransferBufferFull, TransferBufferReady, TriggerOverlapped, TriggerReady, TriggerSkipped, PtpServoStatusChanged, PtpStatusChanged
Action CMD	yes, Action 1 for Trigger
Frame Counter	up to 2 <sup>32</sup>
Payload Size	0 ... 6291696 Byte
Timestamp	64 bit, resolution in nsec, increment = 8
Packet Delay	0 .. 2 <sup>32</sup> - 1 nsec
Packet Resend	Resend Buffer: 48 MB (8 Images)
GigE Vision	v2.0

<sup>1)</sup> Sensor readout, different from pixel format



## Interfaces and Connectors

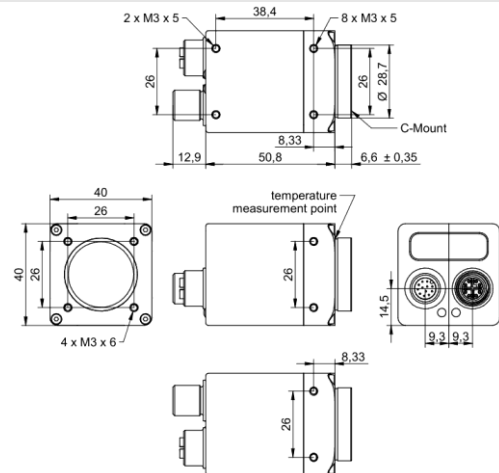
Data and Power Interface	Gigabit Ethernet	Transfer Rate	1000 Mbits/sec
	Fast Ethernet	Transfer Rate	100 Mbits/sec
	Connector:	M12 / 8-pol x-coded (SACC-CI-M12FS-8CON-L180-10G)	
	Assignment:	1 - MX1+	2 - MX1-
		3 - MX2+	4 - MX2-
		5 - MX4+	6 - MX4-
		7 - MX3-	8 - MX3+
Process Interface	Connector:	M12/12-pin a-coded (SACC-CI-M12MS-12CON-L180)	
	Assignment:	1 - Power Vcc	2 - GND (Power)
		3 - IN1 (Line0)	4 - OUT1 (Line4)
		5 - IN2 (Line1)	6 - OUT2 (Line5)
		7 - OUT3 (Line6)	8 - IN3 (Line2)
		9 - OUT4 (Line7)	10 - IN4 (Line3)
		11 - GND (IO)	12 - Power (IO)

## Optical Data

Lens Mount	C-Mount
Optical Filter	-

## Mechanical Data

Housing	aluminum, hard anodized
Protection Class	IP40 (with mounted lens and GigE cable) IP54 (with mounted lens and GigE cable) IP65/67 (with mounted tube and cable) IP69k (with stainless steel housing system)
Weight	137 g
Dimensions	



## Environmental Data

Storage Temperature	-10 °C ... +70 °C
Operating Temperature	0 °C ... +65 °C @ T = Measurement Point or 0 °C ... +70 °C @ internal Temperature Sensor Ambient temperature above 45 °C requires heat dissipation measures.
Int. Temperature Sensor	yes, accuracy: ±2 °C (typ) -40 °C ... 0 °C ±1 °C (typ) 0 °C ... +85 °C
Humidity	10 % ... 90 % non-condensing

<sup>1)</sup> the maximum temperature for Sony sensor characteristics (sensor performance) are guaranteed up to 55°C @ Measurement Point or 59°C @ internal temperature sensor

## LED Signalling

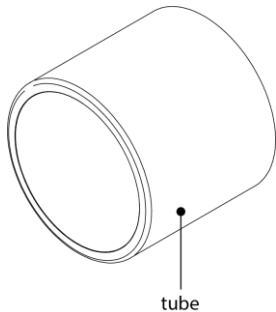
LED	LED 1	Yellow static	Error
		Yellow flash	TX active
	LED 2	Green static	Link ON
		Green flash	RX active

**Optional accessories for IP65/67 protection (ordered separately)**

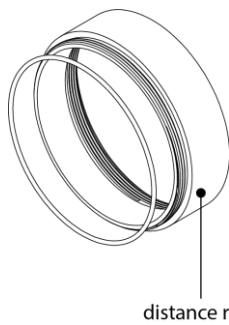


including seals and screws

Article Number	Diameter	Length
11185373	Ø 49,5 mm	5,25 mm
11185377	Ø 65 mm	5,25 mm



Article Number	Diameter	Cover Glass	Length
11185370	Ø 49,5 mm	Acryl	44 mm
11185374	Ø 65 mm		58 mm
11195425	Ø 49,5 mm	Tempered laminated safety glass	44 mm
11195426	Ø 65 mm		58 mm



including seal

Article Number	Diameter	Length
11185372	Ø 49,5 mm	6 mm
11185371	Ø 49,5 mm	12 mm
11211571	Ø 49,5 mm	36 mm
11185376	Ø 65 mm	6 mm
11185375	Ø 65 mm	12 mm
11198906	Ø 65 mm	36 mm

**Electrical Data**

Power Supply (ext.)	VCC: 12 ... 24 V DC ± 20% I: 93 ... 188 mA
Power over Ethernet	Class 1 device VCC: 36 ... 57 V DC I: 61 mA @ 48 VDC
Power Consumption	approx. 2.3 W @ 12VDC and 39 fps approx. 2.9 W @ 48 VDC (PoE) and 39 fps (Factory Setting "Default")
Digital Input	Isolated, short circuit protection U <sub>IN(low)</sub> : 0.0 ... 4.5 VDC U <sub>IN(high)</sub> : 11.0 ... 30.0 VDC I <sub>IN</sub> : 3.0 ... 10.0 mA min. Impulse Length: 2.0 µsec
Digital Output	Isolated, short circuit protected U <sub>EXT</sub> : 12 ... 48 V DC [Power (IO)] (See documentation for guidelines when using >30V.)  I <sub>OUT</sub> :           Continuously:           max. 1.5 A PWM t <sub>ON</sub> max 1s / Duration max 40%:   max. 2.5 A (Max. current can be used with one output or as a sum of all outputs used.)  t <sub>ON</sub> = < 0.2 µsec                           t <sub>OFF</sub> = < 0.2 µsec max. Frequency: 500 kHz
GPIO	no

**Conformity**

Conformity	CE, RoHS, REACH, KC
KC Registration No. / Date	R-R-BkR-VCXG-51MI / 24.12.2020
MTBF	44 years @ T = 45 °C / 29 years @ T = 60 °C T = Measurement Point

**GenICam™ Features**

Short Exposure Range	yes, ShortExposureTimeEnable Short Exposure Range 1 µsec ... 60 sec Default Exposure Range 15 µsec ... 60 sec
Timer	Timer Selector: Timer 1 TimerTriggerSource: Line0, SoftwareTrigger, ExposureStart, ExposureEnd, FrameTransferSkipped, TriggerSkipped, Off TimerDelay: 0 µsec ... 2 sec, Step Size: 1 µsec TimerDuration: 4 µsec ... 2 sec, Step Size: 1 µsec
Counter	Counter Selector: Counter 1, Counter 2 CounterValue: 0 ... 65535 Counter Event Source: Counter1End or Counter2End, ExposureActive, FrameTransferSkipped, FrameTrigger, TriggerSkipped, Line0..3 and Off Counter Reset Source: Counter1End, Counter2End, Line0..3 and Off
Sequencer	Sequencer Characteristics: up to 128 sets, up to 4 possible paths for triggered set transitions, 6 trigger sources: Counter1End, Counter2End, ExposureActive, Line0..3, 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 17.8 msec
Chunk Data	yes, Chunk Selector: Binning, BlackLevel, CounterValue, DeviceTemperature, ExposureTime, FrameID, Gain, Height, Image, ImageControl, LineStatusAll, OffsetX, OffsetY, PixelFormat, SequencerSetActive, Timestamp, TriggerID, Width
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
Custom Data	yes, 128 Byte
SFNC Version	v2.4

## 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	Off
Timer/Counter/Sequencer	Off
Defect Pixel Correction	ON
Fixed Pattern Noise Correction	-
Digital Input	Line0 .. 3, invert = false, line format = Tri State
Digital Output	Line4 .. 7, invert = false, line source = Off, line format = Open Source
GPIO 1/2	no
TriggerSource	All

## Partial Scan @ FullFrame, min Exposure, Mono8 (monochrome camera) or BayerRG8 (color camera)

	Resolution	max. fps acquisition	max. fps interface <sup>2)</sup>
Full HD	1920 x 1080	79	59
SXGA	1280 x 1024	83	83
HD720	1280 x 720	116	116
XGA	1024 x 768	109	109
SVGA	800 x 600	138	138
VGA	640 x 480	170	170
CIF	352 x 288	269	269
QVGA	320 x 240	316	316
QCIF	176 x 144	480	480
LineScan	2048 x 1024	83	58
	2048 x 512	160	117
	2048 x 256	299	235
	2048 x 128	526	470
	2048 x 64	848	848
	2048 x 32	1222	1222
	2048 x 16	1567	1567
	2048 x 8	1825	1825
	2048 x 4	1989	1989
	2048 x 2	2082	2082
	2048 x 1	2132	2132

<sup>2)</sup> depends on the used interface