
**Sensor Information**

Model Name	Sony IMX273
Type	1/2.9" progressive scan CMOS
Shutter	Global Shutter
Resolution	1440 x 1080 pixels
Scan Area	4.96 mm x 3.72 mm
Pixel Size	3.45 μm x 3.45 μm

**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 $\eta$	67,3% @ 536 nm typical

**Acquisition**

Resolution	1440 px x 1080 px		
Interface Frame Rate (depends on used interface performance)	Format	Resolution	max. Frame Rate (@ Trigger Mode) <sup>2)</sup>
	Full Frame	1440 x 1080	79 fps
	Binning 2x2	720 x 540	289 fps
	Binning 2x1	720 x 1080	120 fps
	Binning 1x2	1440 x 540	120 fps
Acquisition Frame Rate <sup>1)</sup> (Burst Mode)	121 fps   $t_{\text{readout}} = 8.23$ msec (max. Res. Full Frame) @ 10 bit		
	111 fps   $t_{\text{readout}} = 8.98$ msec (max. Res. Full Frame) @ 12 bit		
	441 fps   $t_{\text{readout}} = 2.27$ msec (max. Res. Binning 2x2) @ 10 bit		
	323 fps   $t_{\text{readout}} = 3.1$ msec (max. Res. Binning 2x2) @ 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 32, increment 32 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		

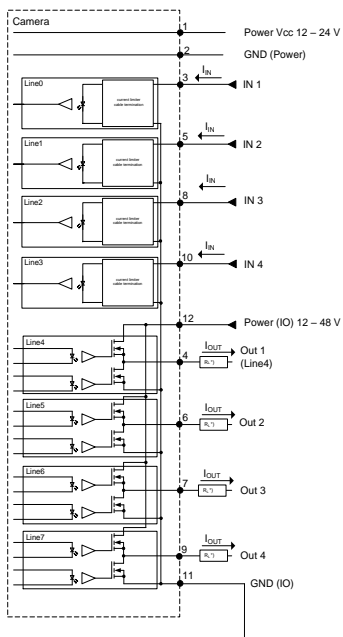
**Image Pre-Processing**

Analog Controls	Exposure Time (1 μsec ... 60 sec   Step Size 1 μsec) 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	-

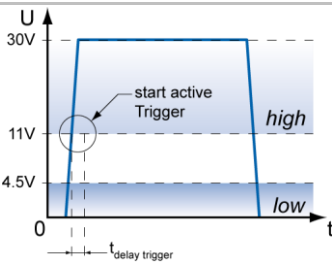
<sup>1)</sup> Sensor readout, different from pixel format

<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> 54.9 µsec @ 10 bit 56.8 µsec @ 12 bit max. Trigger Delay during t <sub>readout</sub> : <sup>1)</sup> 57.3 µsec @ 10 bit 60 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	36 MB 8 Images (Trigger Mode) / 1 Image (Free Running Mode)
Non-volatile Memory	128 kb

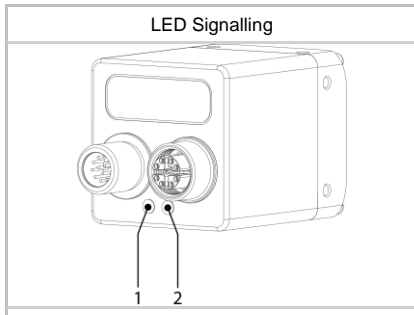
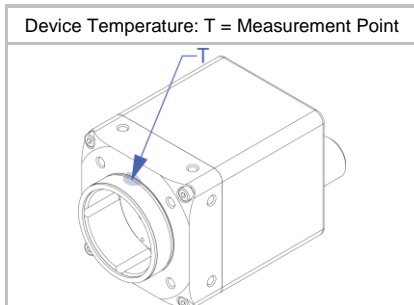
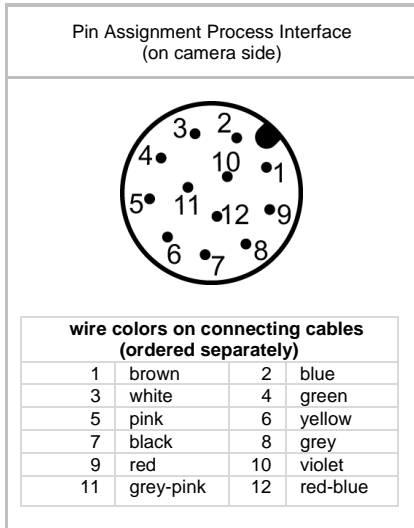
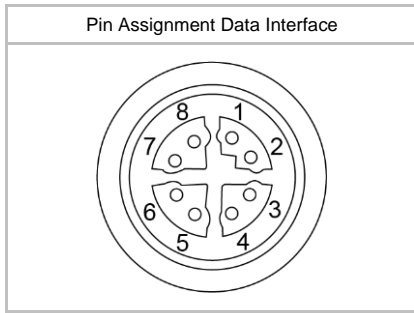
## Network Interface Data

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	DeviceTemperatureStatusChanged, EventLost, Transmission via Asynchronous Message Channel 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 ... 3110640 Byte
Timestamp	64 bit, resolution in nsec, increment = 8
Packet Delay	0 .. 2 <sup>32</sup> - 1 nsec
Packet Resend	Resend Buffer: 24 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)

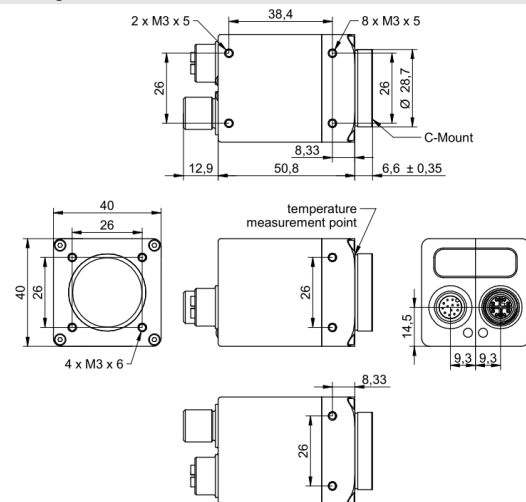
## Optical Data

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

\*) 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

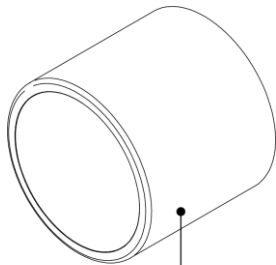
LED	LED 1	Yellow static	Error
		Yellow flash	TX active
LED 2		Green static	Link ON
		Green flash	RX active

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



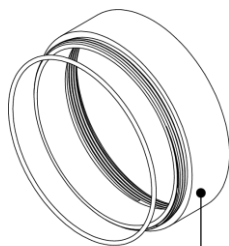
including seals and screws

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



tube

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



distance ring

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: 107 ... 215 mA
Power over Ethernet	Class 1 device VCC: 36 ... 57 V DC I: 67 mA @ 48 VDC
Power Consumption	approx. 2.6 W @ 12VDC and 79 fps approx. 3.2 W @ 48 VDC (PoE) and 79 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, EAC
KC Registration No. / Date	- / -
MTBF	48 years @ T = 45 °C / 32 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 9 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>
SXGA	1280 x 1024	127	94
HD720	1280 x 720	178	133
XGA	1024 x 768	167	156
SVGA	800 x 600	211	211
VGA	640 x 480	259	259
CIF	352 x 288	409	409
QVGA	320 x 240	478	478
QCIF	176 x 144	720	720
LineScan	1440 x 1024	127	83
	1440 x 512	244	167
	1440 x 256	452	334
	1440 x 128	787	668
	1440 x 64	1247	1247
	1440 x 32	1763	1763
	1440 x 16	2223	2223
	1440 x 8	2556	2556
	1440 x 4	2763	2763
	1440 x 2	2879	2879
	1440 x 1	2941	2941

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