

### Sensor Information

Model Name	Sony IMX250MZR
Type	2/3" progressive scan CMOS
Shutter	Global Shutter
Resolution	2448 x 2048 pixels
Scan Area	8.44 mm x 7.06 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 $\eta$	25% @ 536 nm typical

### Acquisition

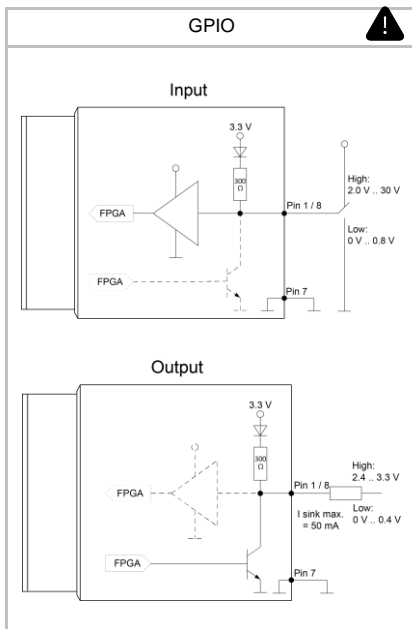
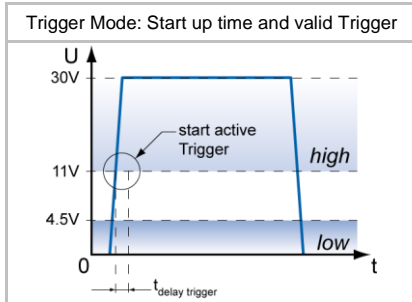
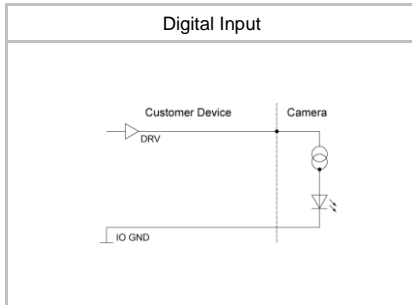
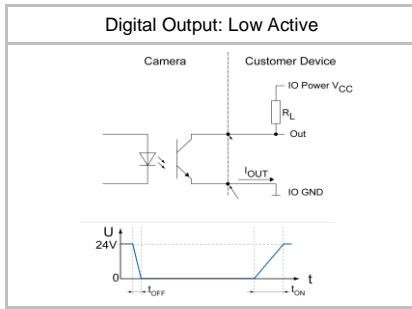
Resolution	2448 px x 2048 px		
Interface Frame Rate (depends on used interface performance)	Format	Resolution	max. Frame Rate (@ Trigger Mode) <sup>2)</sup>
	Full Frame	2448 x 2048	24 fps
	Binning 2x2	1224 x 1024	36 fps
	Binning 2x1	1224 x 2048	36 fps
	Binning 1x2	2448 x 1024	36 fps
Acquisition Frame Rate <sup>1)</sup> (Burst Mode)	36 fps   $t_{\text{readout}} = 27.8$ msec (max. Res. Full Frame) @ 12 bit		
	36 fps   $t_{\text{readout}} = 27.8$ 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 16, increment 16		
	Height: minimum 2, increment 2		
Adjustable Acquisition Frame Rate	Off or Off or 0,01 ... 1773 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)
Gamma Correction	Gamma (0.1 ... 2   available if LUT is enabled)
LUT	Luminance (12 bit)
Color Models	Mono
Color Processing	-
Color Adjustment	-
Color Enhancement	-
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 Correction	-

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

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



<sup>1)</sup> 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 <sub>readout</sub> : <sup>1)</sup> 32 µsec @ 12 bit max. Trigger Delay during t <sub>readout</sub> : <sup>1)</sup> 40,3 µsec @ 12 bit
Trigger Delay	0 ... 2 sec, Tracking and buffering of up to 256 triggers
External Flash Sync	via Exposure Active t <sub>delay flash</sub> ≤ 3 µsec, t <sub>duration</sub> = t <sub>exposure</sub>

## 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

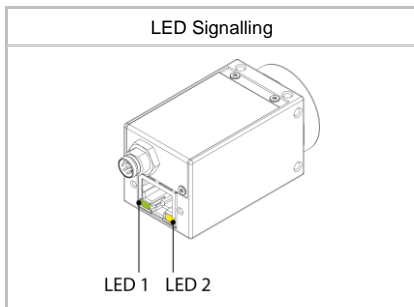
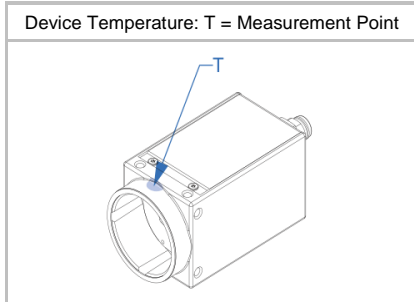
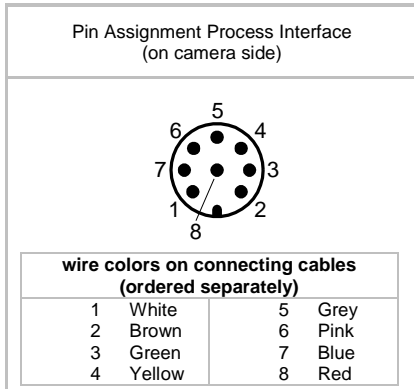
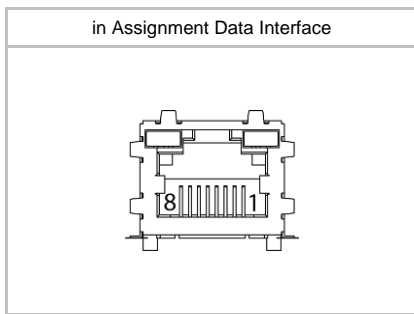
Image Buffer	115 MB 8 Images (Trigger Mode) / 1 Image (Free Running Mode)
Non-volatile Memory	128 kb

## 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, ExposureEnd, ExposureStart, FrameEnd, FrameStart, FrameTransferSkipped, GigEVisionError, GigEVisionHeartbeatTimeOut, PrimaryApplicationSwitch, Line0..2 FallingEdge, Line0..2 RisingEdge, TransferBufferFull, TransferBufferReady, TriggerOverlapped, TriggerReady, TriggerSkipped
Transmission via Asynchronous Message Channel	
Action CMD	yes, Action 1 for Trigger
Frame Counter	up to 2 <sup>32</sup>
Payload Size	0 ... 10027208 Byte
Timestamp	64 bit, resolution in nsec, increment = 8
Packet Delay	0 .. 2 <sup>32</sup> - 1 nsec
Packet Resend	Resend Buffer: 77 MB (8 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	
Process Interface	Assignment:	1 - MX1+	2 - MX1-
		3 - MX2+	4 - MX3+
		5 - MX3-	6 - MX2-
		7 - MX4+	8 - MX4-
	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.

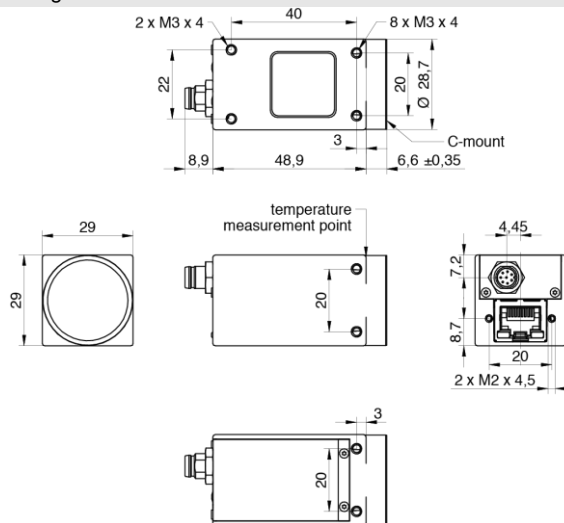
## Optical Data

Lens Mount	C-Mount
Optical Filter	-

## Mechanical Data

Housing	Zinc die casting, nickel-chrome-plated
Protection Class	IP40 (with mounted lens and GigE cable)
Weight	120 g

### Dimensions



## 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 30 °C requires heat dissipation measures.
Int. Temperature	yes, accuracy:
Sensor	±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 53°C @ Measurement Point or 60°C @ internal temperature sensor

## LED Signalling

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

## Electrical Data

Power Supply (ext.)	VCC: 12 ... 24 V DC $\pm$ 20% I: 116 ... 234 mA
Power over Ethernet	Class 1 device VCC: 36 ... 57 V DC I: 71 mA @ 48 VDC
Power Consumption	approx. 2.8 W @ 12VDC and 24 fps approx. 3.4 W @ 48 VDC (PoE) and 24 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 $\mu$ sec
Digital Output	Optocoupler $U_{EXT}$ : 5 ... 30 V DC $I_{OUT}$ : max. 50 mA $t_{ON}$ = typ. 3 $\mu$ sec $t_{OFF}$ = typ. 40 $\mu$ 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 $\mu$ 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, EAC
KC Registration No. / Date	- / -
MTBF	51 years @ T = 45 °C / 33 years @ T = 60 °C T = Measurement Point

## GenICam™ Features

Short Exposure Range	yes, ShortExposureTimeEnable Short Exposure Range 1 $\mu$ sec ... 60 sec Default Exposure Range 15 $\mu$ sec ... 60 sec
Timer	Timer Selector: Timer 1 TimerTriggerSource: Line0, SoftwareTrigger, ExposureStart, ExposureEnd, FrameTransferSkipped, TriggerSkipped, Action 1 and Off TimerDelay: 0 $\mu$ sec ... 2 sec, Step Size: 1 $\mu$ sec TimerDuration: 4 $\mu$ sec ... 2 sec, Step Size: 1 $\mu$ 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 27.8 msec
Chunk Data	yes, Chunk Selector: Binning, BlackLevel, DeviceTemperature, ExposureTime, FrameID, Gain, Height, Image, ImageControl, LineStatusAll, OffsetX, OffsetY, PixelFormat, Timestamp, 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
SFNC Version	v2.3

## Factory Settings after Start-Up

Ethernet IP Configuration	
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, 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 <sup>2)</sup>
Full HD	1920 x 1080	66	59
SXGA	1280 x 1024	69	69
HD720	1280 x 720	91	91
XGA	1024 x 768	115	115
SVGA	800 x 600	142	142
VGA	640 x 480	224	224
CIF	352 x 288	263	263
QVGA	320 x 240	398	398
QCIF	176 x 144		
LineScan	2448 x 2048	35	24
	2448 x 1024	69	49
	2448 x 512	134	98
	2448 x 256	248	197
	2448 x 128	435	394
	2448 x 64	696	696
	2448 x 32	994	994
	2448 x 16	1264	1264
	2448 x 8	1464	1464
	2448 x 4	1590	1590
	2448 x 2	1661	1661
	2448 x 1	-	-

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