
**Device Information**

Model Name	VCXG.2-82M.I
Vendor Name	Baumer

**Sensor Information**

Sensor Name	Sony IMX546 Gen4
Type	2/3" progressive scan CMOS
Shutter	Global Shutter
Resolution	2848 x 2832 pixels
Scan Area	7.8 mm x 7.75 mm
Pixel Size	2.74 µm x 2.74 µm

**Data Quality**

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

Dark Noise ( $\sigma$ )	2.3 e- typical
Saturation	9300 e- typical
Dynamic Range	70 dB typical
SNR	40 dB typical
Quantum efficiency $\eta$	70% @ 536 nm typical

**Acquisition**

Resolution	2848 px x 2832 px		
Interface Frame Rate (depends on used interface performance)	Format	Resolution	max. Frame Rate (@ Trigger Mode) <sup>2)</sup>
	Full Frame	2848 x 2832	15 fps
	Binning 2x2	1424 x 1416	59 fps
	Binning 2x1	1424 x 2832	16 fps
	Binning 1x2	2848 x 1416	16 fps
Acquisition Frame Rate <sup>1)</sup> (Burst Mode)	16 fps   $t_{\text{readout}} = 60.7$ msec (max. Res. Full Frame) @ 10 bit		
	16 fps   $t_{\text{readout}} = 60.7$ msec (max. Res. Full Frame) @ 12 bit		
	59 fps   $t_{\text{readout}} = 16.8$ msec (max. Res. Binning 2x2) @ 10 bit		
	59 fps   $t_{\text{readout}} = 16.8$ 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 32, increment 32 Height: minimum 1, increment 1		
Adjustable Acquisition Frame Rate	Off or 0.01 ... 65535 Hz		
Acquisition Mode	Continuous, Single Frame and Multi Frame		
Acquisition Status	AcquisitionActive, AcquisitionTrigger Wait		
Exposure Mode	Timed		
Shutter Mode	Global		
Readout Mode	Sequential		

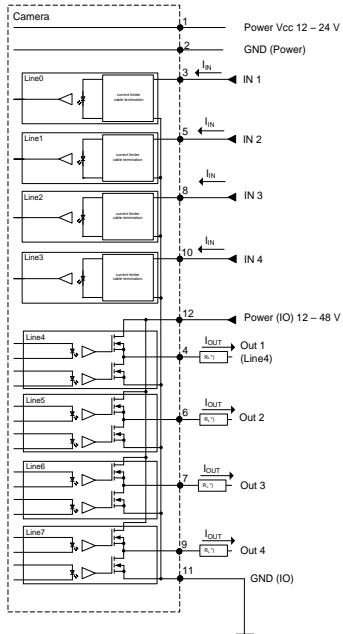
**Image Pre-Processing**

Analog Controls	Exposure Time (1 µsec ... 60 sec   Step Size 1 µsec) Gain (0...48 dB), Offset (0 ... 255 LSB   12 bit)
Auto Function	ExposureAuto and GainAuto with BrightnessAutoPriority based on BrightnessAuto ROI
LUT	Luminance (12 bit)
Color Models	Mono
Color Processing	-
Color Adjustment	-

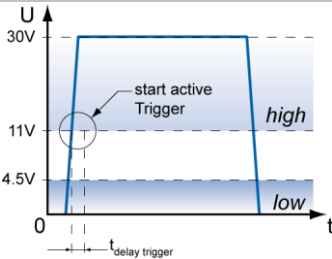
<sup>1)</sup> Sensor readout, different from pixel format

<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

Color Enhancement	-
Color Tolerance	-
Binning Horizontal	1 or 2
Binning Vertical	1 or 2
Defect Pixel Correction	via Defect Pixel List with up to 512 Pixel Coordinates
Image Flipping	Horizontal, vertical
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, Counter 1, 2 End, Action CMD (Action 1), All or Off fixed Trigger Delay out of $t_{readout}$ : <sup>1)</sup> 199 $\mu$ sec @ 12 bit max. Trigger Delay during $t_{readout}$ : <sup>1)</sup> 199 $\mu$ sec @ 12 bit
Trigger Delay	0 ... 2 sec, Tracking and buffering of up to 256 triggers
External Flash Sync	via Exposure Active $t_{delay flash} \leq 3 \mu$ sec, $t_{duration} = t_{exposure}$
Encoder Function	yes, via Counter and Trigger Source
PTP Function	-

## Digital I/Os

Lines	Input: Line 0 .. 3, Output: Line 4 .. 7, GPIO: no
Line Sources (Output)	Off, Line 0-3, ExposureActive, Timer1Active ReadoutActive, UserOutput 1-4 and TriggerReady
Line Format (Output)	yes, Tri-State, PushPull, OpenDrain, OpenSource
PWM function (Output)	yes, Line 4 .. 7 PWM Mode: Off, One Pulse, FixedFrequency PWM feature: PWMDuration, PWMDutyCycle Configuration Mode for lightning protection: MaxPWMDuration, MaxPWMDutyCycle
Line Debouncer (Input)	Low and high signal separately selectable Debouncing Time 0 ... 5 msec, Step Size: 1 $\mu$ sec

## Memory

Image Buffer	185 MB
Non-volatile Memory	8 Images (Trigger Mode) / 1 Image (Free Running Mode)
Non-volatile Memory	128 kb

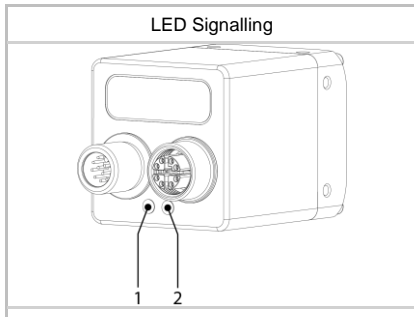
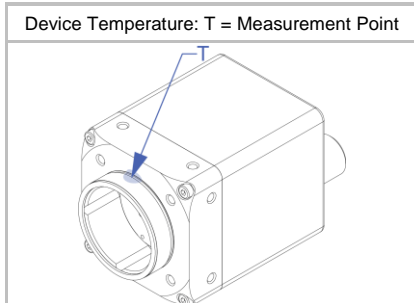
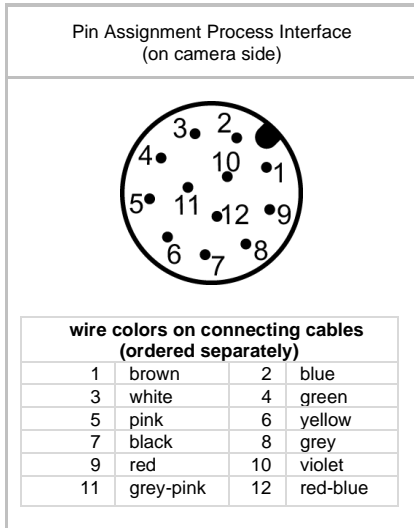
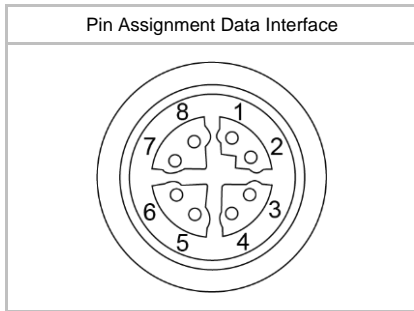
## Network Interface Data

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
Events	ExposureEnd, ExposureStart, FrameEnd, FrameStart, FrameTransferSkipped, GigE VisionError, GigE VisionHeartbeatTimeOut, PrimaryApplicationSwitch, Line0..7 FallingEdge, Line0..7 RisingEdge, TransferBufferFull, TransferBufferReady, TriggerOverlapped, TriggerReady, TriggerSkipped

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



## GigE Vision® Features

Action CMD	yes, Action 1 for Trigger
Frame Counter	up to $2^{32}$
Payload Size	0 ... 16131296 Byte
Timestamp	64 bit, resolution in nsec, increment = 8
Packet Delay	0 .. $2^{32} - 1$ nsec
Packet Resend	Resend Buffer: 124 MB (8 Images)
GigE Vision	v2.0

## Interfaces and Connectors

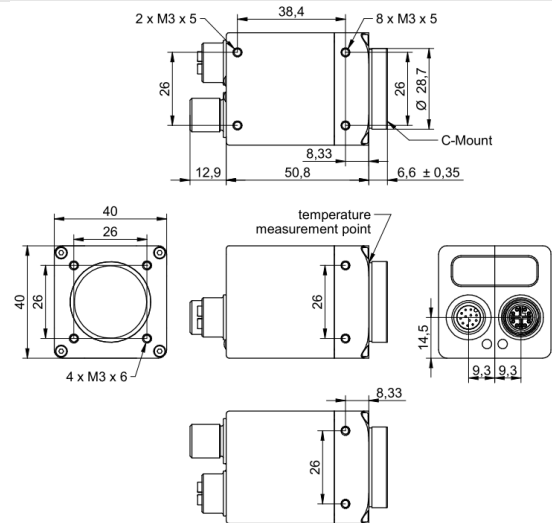
Data and Power Interface	Gigabit Ethernet	Transfer Rate	1000 Mbits/sec
	Fast Ethernet	Transfer Rate	100 Mbits/sec
	Connector:	M12 / 8-pol x-coded (SACC-CI-M12FS-8CON-L180-10G)	
	Assignment:	1 - MX1+	2 - MX1-
		3 - MX2+	4 - MX2-
		5 - MX4+	6 - MX4-
		7 - MX3-	8 - MX3+
Process Interface	Connector:	M12/12-pin 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

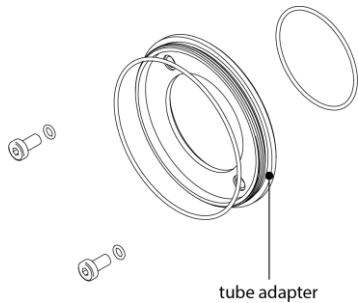
Lens Mount	C-Mount
Optical Filter	-

## 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	



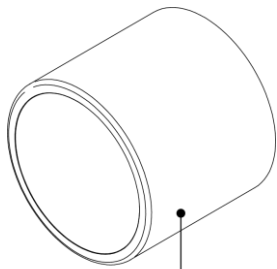
**Optional accessories for IP65/67 protection (ordered separately)**



tube adapter

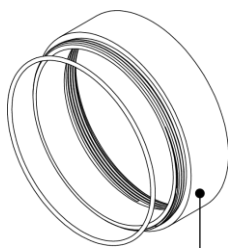
including seals and screws

Article Number	Diameter	Length
11185373	Ø 49,5 mm	5,25 mm
11185377	Ø 65 mm	5,25 mm
11704311	Ø 95 mm	5,25 mm



tube

Article Number	Diameter	Cover Glass	Length
11185370	Ø 49,5 mm	PMMA (Acryl)	44 mm
11185374	Ø 65 mm		58 mm
11704312	Ø 95 mm		70 mm
11701124	Ø 49,5 mm	Tempered laminated safety glass	44 mm
11701125	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
11704395	Ø 95 mm	6 mm
11704397	Ø 95 mm	12 mm
11704394	Ø 95 mm	36 mm

**Environmental Data**

Storage Temperature	-20 °C ... + 70 °C
Operating Temperature	0 °C ... +65 °C @ T = Measurement Point or 0 °C ... +73 °C @ internal Temperature Sensor
	Note: Ambient temperature above 38 °C requires heat dissipation measures.
Int. Temperature Sensor	yes, accuracy: ±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 50 °C @ Measurement Point or up to 60 °C @ internal temperature sensor

**LED Signalling**

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

**Electrical Data**

Power Supply (ext.)	VCC: 12 ... 24 V DC ± 20% I: 120 ... 242 mA
Power over Ethernet	Class 2 device VCC: 36 ... 57 V DC I: 75 mA @ 48 VDC
Power Consumption	approx. 2.9 W @ 12 VDC and 15 fps approx. 3.6 W @ 48 VDC (PoE) and 15 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 Registration No. / Date	- / -
MTBF	41 years @ T = 45 °C / 26 years @ T = 60 °C T = Measurement Point

## GenICam™ Features

Short Exposure Range	yes, ShortExposureTimeEnable Short Exposure Range 1 ... 3 µsec - 23 µsec ... 60 sec Default Exposure Range 23 µsec ... 60 sec
Timer	Timer Selector: Timer 1 TimerTriggerSource: Line0, SoftwareTrigger, ExposureStart, ExposureEnd, FrameTransferSkipped, TriggerSkipped, Action 1 and 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
User Sets	Factory Settings: UserSet0 (read only) Freely Programmable: UserSet1, UserSet2, UserSet3 Parameters: any user definable Parameter
Acquisition Abort	Delay up to 60.7 msec
Chunk Data	yes, Chunk Selector: Binning, BlackLevel, CounterValue, DeviceTemperature, ExposureTime, FrameID, Gain, Height, Image, ImageControl, LineStatusAll, OffsetX, OffsetY, PixelFormat, SequencerSetActive, 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
Custom Data	yes, 128 Byte with CustomDataKonfiguration Mode
Calibration Data	yes, camera calibration values can stored: CalibrationMatrix, CalibrationMatrixNew, CalibrationFocalLenght, CalibrationAngularAperture, GeometryDistortionValue: k1, k2, p1, p2, k3, CalibrationVector: tvec, rvec and CalibrationDataVersion
SFNC Version	2.4.0

### Factory Settings after Start-Up

Ethernet IP Configuration	DHCP, LLA
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	40	40
SXGA	1280 x 1024	42	42
HD720	1280 x 720	57	57
XGA	1024 x 768	54	54
SVGA	800 x 600	67	67
VGA	640 x 480	81	81
CIF	352 x 288	120	120
QVGA	320 x 240	136	136
QCIF	176 x 144	187	187
LineScan	2848 x 2048	22	21
	2848 x 1024	42	42
	2848 x 512	77	77
	2848 x 256	131	131
	2848 x 128	199	199
	2848 x 64	270	270
	2848 x 32	329	329
	2848 x 16	369	369
	2848 x 8	393	393
	2848 x 4	393	393
	2848 x 2	393	393
2848 x 1	393	393	

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