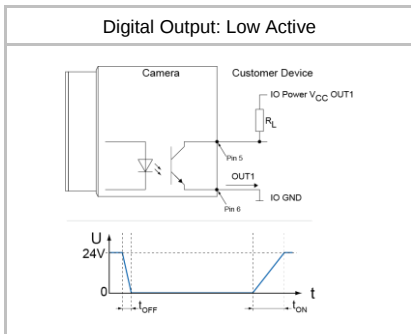
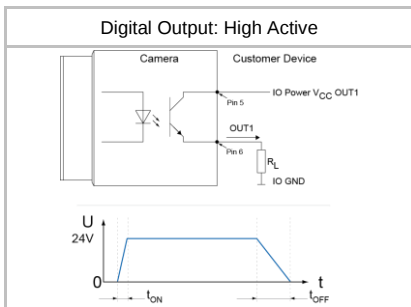
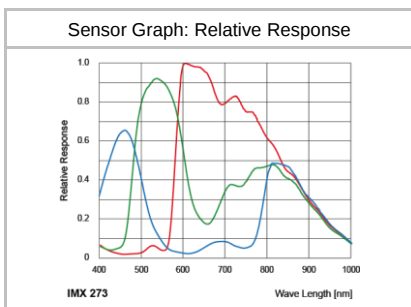




¹⁾ Sensor readout, different from pixel format

²⁾ depends on the used interface



Device Information

Model Name	VCXG.2-15C
Vendor Name	Baumer

Sensor Information

Sensor Name	Sony IMX273 Gen2
Type	1/2.9" progressive scan CMOS
Shutter	Global Shutter
Resolution	1440 × 1080 pixels
Scan Area	4.96 mm × 3.72 mm
Pixel Size	3.45 µm × 3.45 µm

Data Quality

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

Dark Noise (σ)	2 e- typical
Saturation	9500 e- typical
Dynamic Range	71 dB typical
SNR	40 dB typical
Quantum efficiency η	48% @ 465 nm, 58% @ 536 nm, 54% @ 631 nm typical

Acquisition

Resolution	1440 px × 1080 px		
Interface Frame Rate (depends on used interface performance)	Format	Resolution	max. Frame Rate (@ Trigger Mode) ²⁾
	Full Frame	1440 × 1080	79 fps
	Binning 2x2	720 × 540	120 fps
	Binning 2x1	720 × 1080	120 fps
	Binning 1x2	1440 × 540	120 fps
Acquisition Frame Rate ¹⁾ (Burst Mode)	121 fps $t_{\text{readout}} = 8.26 \text{ msec}$ (max. Res. Full Frame) @ 10 bit		
	111 fps $t_{\text{readout}} = 9.01 \text{ msec}$ (max. Res. Full Frame) @ 12 bit		

Pixel Formats

BayerRG8, BayerRG10, BayerRG12, BayerRG12p, Mono8, Mono10, Mono12, Mono12p, RGB8, BGR8

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

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
BalanceWhiteAuto and ColorTransformationAuto based on BalanceWhiteAuto ROI

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) based on Region of Interest (ROI)

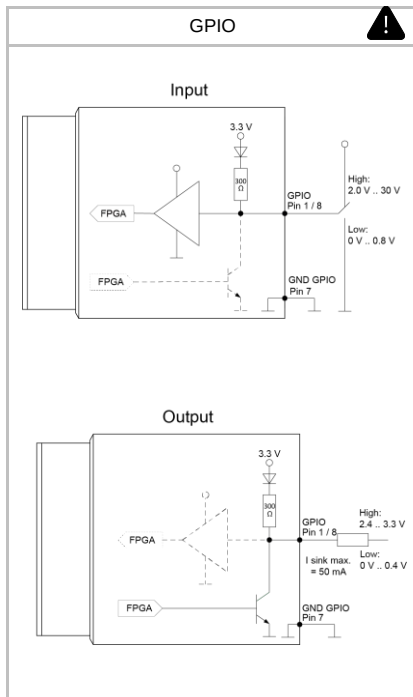
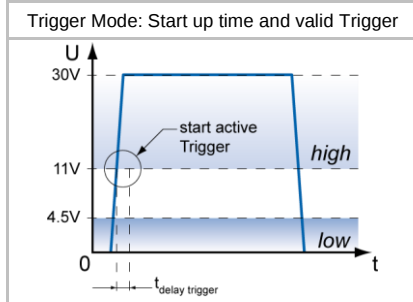
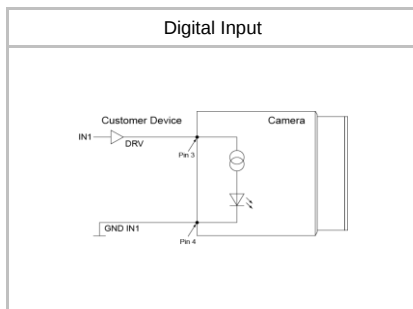


Image Pre-Processing

Color Enhancement Color Transformation to sRGB color space by optimized Matrix for 3000 K, 5000 K, 6500 K and 9500 K Lightsources or User defined Matrix

Color Tolerance	-
Binning Horizontal	1 or 2
Binning Vertical	1 or 2
Defect Pixel Correction	yes, static DPC: 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), Software, Counter 1, 2 End, Action CMD (Action 1), All or Off fixed Trigger Delay out of treadout: ¹⁾ 55 µsec @ 10 bit 57 µsec @ 12 bit max. Trigger Delay during treadout: ¹⁾ 57 µsec @ 10 bit 60 µsec @ 12 bit
Trigger Delay	0 ... 2 sec, Tracking and buffering of up to 256 triggers
External Flash Sync	via Exposure Active $t_{\text{delay flash}} \leq 3 \mu\text{sec}$, $t_{\text{duration}} = t_{\text{exposure}}$
Encoder Function	yes, via Counter and Trigger Source
PTP Function	-

Digital I/Os

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

Memory

Image Buffer	35,6 MB 8 Images (Trigger Mode) / 1 Image (Free Running Mode)
Non-volatile Memory	128 kb

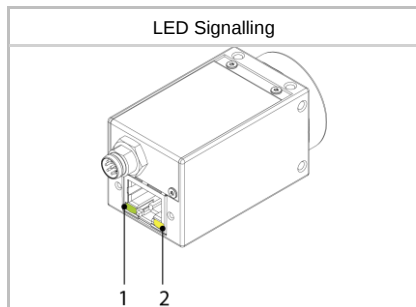
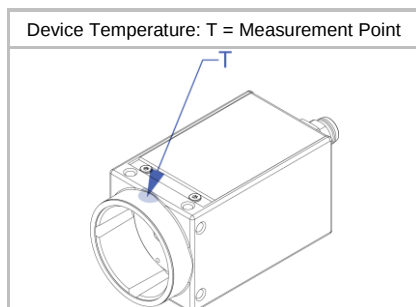
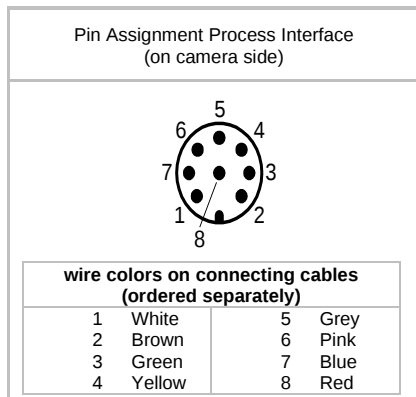
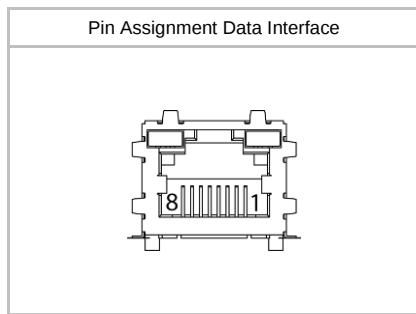
Network Interface Data

Interface	Gigabit Ethernet 1000BASE-T 1000 Mb/s/sec Fast Ethernet 100 BASE-T 100 Mb/s/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
Action CMD	yes, Action 1 for Trigger
Frame Counter	up to 2 ³²
Payload Size	0 ... 4665824 Byte
Timestamp	64 bit, resolution in nsec, increment = 8
Packet Delay	0 ... 2 ³² - 1 nsec
Packet Resend	Resend Buffer: 36 MB (8 Images)
GigE Vision	v2.0

¹⁾ 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:	8P8C Modular Jack (RJ45), screwable TYPE090 (according to GigE Vision Mechanical Supplement)	
	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.

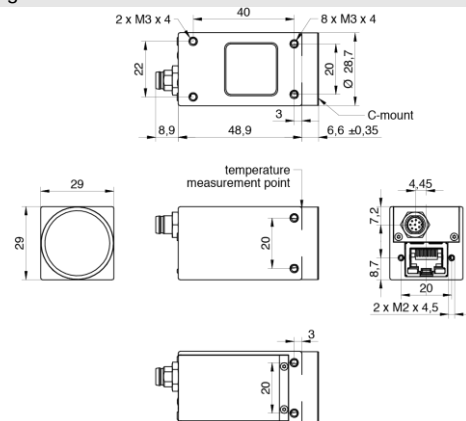
Optical Data

Lens Mount	C-Mount
Optical Filter	IR cut filter

Mechanical Data

Housing	Zinc die casting, baked varnish
Protection Class	IP40 (with mounted lens and GigE cable)
Weight	120 g

Dimensions



Additional Cooling Pipe	no
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Environmental Data

Storage Temperature	-20 °C ... + 70 °C
Operating Temperature	0 °C ... +65 °C @ T = Measurement Point or *) 0 °C ... +75 °C @ internal Temperature Sensor
	Note: Ambient temperature above 34 °C requires heat dissipation measures.
Int. Temperature Sensor	yes, InHouse: step size 1 °C, accuracy: ±0.5 °C (typ) 0 °C ... +85 °C
Humidity	10 % ... 90 % non-condensing

*) 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	Yellow static - Error
		Yellow flash - TX active
	LED 2	Green static - Link ON
		Green flash - RX active

Electrical Data

Power Supply (ext.)	VCC: 12 ... 24 V DC $\pm$ 20% I: 120 ... 242 mA
Power over Ethernet	Class 1 device VCC: 36 ... 57 V DC I: 73 mA @ 48 VDC
Power Consumption	approx. 2.9 W @ 12 VDC and 79 fps approx. 3.5 W @ 48 VDC (PoE) and 79 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, UL Recognized, KC
KC Registration No. / Date	R-R-BkR-VCXG2-15M / 26.02.2024
MTBF	57 years @ T = 45 °C / 37 years @ T = 60 °C T = Measurement Point

GenlCam™ Features

Short Exposure Range	yes, ShortExposureTimeEnable Short Exposure Range 1 μ sec ... 60 sec Default Exposure Range 15 μ sec ... 60 sec
Timer	Timer Selector: Timer 1 TimerTriggerSource: Line0, SoftwareTrigger, ExposureStart, ExposureEnd, FrameTransferSkipped, TriggerSkipped, 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, Line0..2 and Off Counter Reset Source: Counter1End, Counter2End, Line0..2 and Off

GenICam™ Features

Sequencer	Sequencer Characteristics: up to 128 sets, up to 4 possible pathes for triggered set transitions, 6 trigger sources: Counter1End, Counter2End, ExposureActive, Line0..2, 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 9.1 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, if temperature status changed from 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
Optical Black Pixel Area	-
Black Level Auto Adjust	-
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	BayerRG8
Partial Scan	Off
Acquisition Frame Rate	Off
Timer/Counter/Sequencer	Off
Defect Pixel Correction	On
Fixed Pattern Noise Correction	-
Optical Black Pixel Area	-
Black Level Auto Adjust	-
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 (monochrome camera) or BayerRG8 (color camera)

	Resolution	max. fps acquisition	max. fps interface ²⁾
SXGA	1280 x 1024	127	94
HD720	1280 x 720	177	133
XGA	1024 x 768	167	156
SVGA	800 x 600	210	210
VGA	640 x 480	258	258
CIF	352 x 288	405	405
QVGA	320 x 240	472	472
QCIF	176 x 144	708	708
SXGA	1280 x 1024	127	94
HD720	1280 x 720	177	133
XGA	1024 x 768	167	156
SVGA	800 x 600	210	210
VGA	640 x 480	258	258
CIF	352 x 288	405	405
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²⁾ depends on the used interface