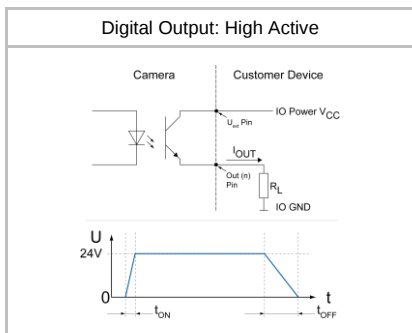
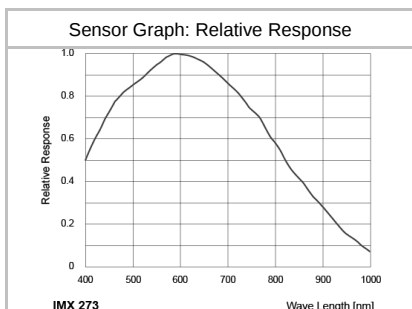




Device Information

Model Name	VCXU.2-15M
Vendor Name	Baumer

Sensor Information

Sensor Name	Sony IMX273 Gen2
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 μ m x 3.45 μ m

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	64% @ 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) ²⁾
	Full Frame	1440 x 1080	225 fps
	Binning 2x2	720 x 540	501 fps
	Binning 2x1	720 x 1080	225 fps
	Binning 1x2	1440 x 540	225 fps
Acquisition Frame Rate ¹⁾	227 fps t _{readout} = 4.4 msec (max. Res. Full Frame) @ 10 bit		
	166 fps t _{readout} = 6.01 msec (max. Res. Full Frame) @ 12 bit		
	508 fps t _{readout} = 1.97 msec (max. Res. Binning 2x2) @ 10 bit		
	320 fps t _{readout} = 3.12 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		

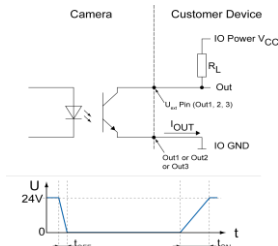
Image Pre-Processing

Analog Controls	Exposure Time (1 μ sec ... 60 sec Step Size 1 μ sec) Gain (0...48 dB), Offset (0 ... 255 LSB 12 bit)
Auto Function	ExposureAuto and GainAuto with BrightnessAutoPriority based on BrightnessAuto ROI
Gamma Correction	Gamma (0.1 ... 2 available if LUT is enabled)
LUT	Luminance (12 bit)
Color Models	Mono
Color Processing	-
Color Enhancement	-

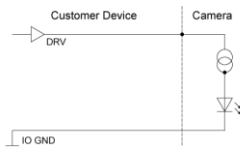
¹⁾ Sensor readout, different from pixel format

²⁾ depends on the used interface

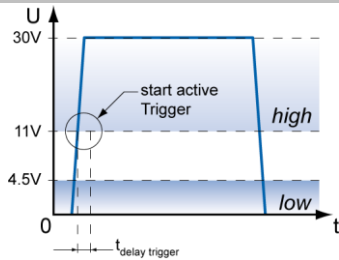
Digital Output: Low Active



Digital Input



Trigger Mode: Start up time and valid Trigger



GPIO

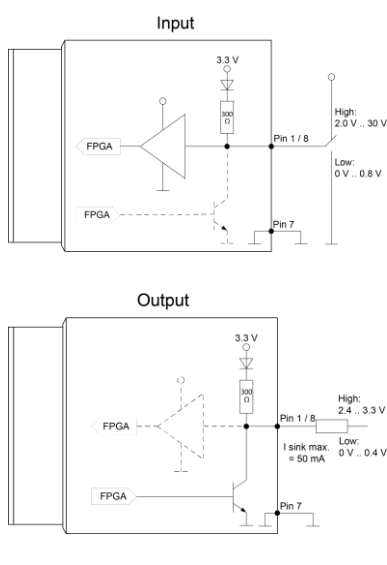


Image Pre-Processing

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, All or Off fixed Trigger Delay out of t_readout: ¹⁾ 45 µsec @ 10 bit 49 µsec @ 12 bit max. Trigger Delay during t_readout: ¹⁾ 44 µsec @ 10 bit 49 µsec @ 12 bit
Trigger Delay	0 ... 2 sec, Tracking and buffering of up to 256 triggers
External Flash Sync	via Exposure Active t_delay flash ≤ 3 µsec, t_duration = t_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	214 MB 96 Images (Trigger Mode) / 1 Image (Free Running Mode)
Non-volatile Memory	128 kb

Interface Data

Interface	USB3.0 (5000 Mbits/sec)
USB Vendor ID / Product ID	0x2825 / 0x0171

USB 3 Vision® Features

Events Transmission via Asynchronous Message Channel	DeviceTemperatureStatusChanged, EventLost, ExposureEnd, ExposureStart, FrameEnd, FrameStart, FrameTransferSkipped, Line0..2 FallingEdge, Line0..2 RisingEdge, TransferBufferFull, TransferBufferReady, TriggerOverlapped, TriggerReady, TriggerSkipped
Frame Counter	up to 2 ³²
Payload Size	0 ... 3110624 Byte
Timestamp	64 bit, resolution in nsec, increment = 8
USB Vision	v1.0.1

Interfaces and Connectors

Data and Power Interface	USB 3.0	Transfer Rate	5000 Mbits/sec
	USB 2.0	Transfer Rate	480 Mbits/sec
	Connector:	USB 3.0 Micro B	
Pin Assignment:	1 - VBUS	2 - D-	
	3 - D+	4 - ID	
	5 - GND	6 - MicB_SSTX-	
	7 - MicB_SSTX+	8 - GND_DRAIN	
	9 - MicB_SSRX-	10 - MicB_SSRX+	

¹⁾ Sensor readout, different from pixel format

A diagram of a 10-position slide rule scale. It consists of a horizontal bar with a central notch. On the left side of the notch, there are five positions numbered 1, 2, 3, 4, and 5. On the right side of the notch, there are five positions numbered 6, 7, 8, 9, and 10. Each position is represented by a small rectangular block with a vertical line in the center.

A circular arrangement of 8 dots. The dots are numbered 1 through 8, with the numbers placed outside the circle. The dots are arranged in a circle, with one dot at the top (5), one at the bottom (8), and six dots in between. The numbers 1, 2, 3, 4, 6, and 7 are placed around the circle, with 1 and 2 at the bottom left, 3 and 4 at the bottom right, 5 at the top, and 6 and 7 at the top left.

1	White	5	Grey
2	Brown	6	Pink
3	Green	7	Blue
4	Yellow	8	Red

A line drawing of the front panel of the device. It shows a rectangular box with a circular LED indicator on the left side. A label 'LED' with a line points to the indicator. On the right side, there are two circular ports, one of which is labeled 'GND'.

Technical drawings of the C-Mount camera module showing dimensions in millimeters:

- Top View:**
 - Overall width: 37.8
 - Overall height: 29
 - Mounting hole spacing: 30
 - Mounting hole diameter: $\varnothing 2.8$
 - Mounting hole offset from edge: 8.9
 - Internal feature offset: 6.6 ± 0.35
 - Internal feature width: 3
 - Internal feature height: 20
 - Mounting holes: 2 x M3 x 4
- Front View:**
 - Overall width: 29
 - Overall height: 29
 - Temperature measurement point indicated.
- Side View:**
 - Overall width: 18
 - Overall height: 6
 - Mounting hole diameter: $\varnothing 2.8$
 - Mounting hole offset from edge: 6.15
 - Mounting hole offset from center: 8.2
 - Mounting holes: 2 x M2 x 4

Electrical Data

Power Supply	bus powered via USB3.0 interface
Power Consumption	approx. 2.9 W @ 225 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-VCXU2-15M / 26.02.2024
MTBF	60 years @ T = 45 °C / 39 years @ T = 60 °C T = Measurement Point

GenICam™ 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 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
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

GenICam™ Features

User Sets	Factory Settings: UserSet0 (read only) Freely Programmable: UserSet1, UserSet2, UserSet3 Parameters: any user definable Parameter
Acquisition Abort	Delay up to 6.1 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
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

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 (monochrome camera) or BayerRG8 (color camera)

	Resolution	max. fps acquisition	max. fps interface ²⁾
SXGA	1280 x 1024	238	238
HD720	1280 x 720	332	332
XGA	1024 x 768	313	313
SVGA	800 x 600	394	394
VGA	640 x 480	483	483
CIF	352 x 288	759	759
QVGA	320 x 240	886	886
QCIF	176 x 144	1327	1327
LineScan	1440 x 1024	238	238
	1440 x 512	456	456
	1440 x 256	839	839
	1440 x 128	1448	1448
	1440 x 64	2271	2271
	1440 x 32	3173	3173
	1440 x 16	3960	3960
	1440 x 8	4520	4520
	1440 x 4	4864	4864
	1440 x 2	5056	5056
	1440 x 1	5158	5158

²⁾ depends on the used interface