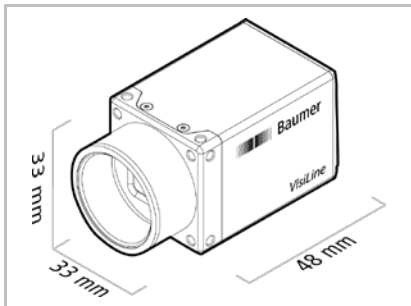
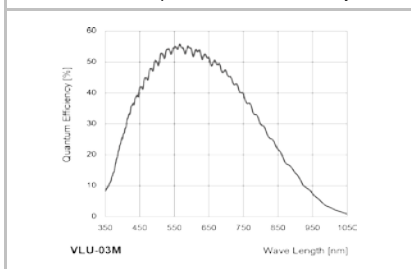
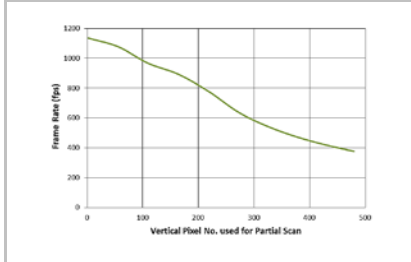


VLU-03M

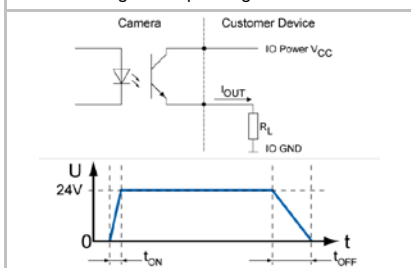
Digital Monochrome Matrix Camera, USB 3.0



Sensor Graph: Quantum Efficiency


 Frame Rates / Partial Scan
(Measured at Mono8/BayerRG8-Format)


Digital Output: High Active



Sensor Information

Model Name	CMOSIS CMV300
Type	1/3" progressive scan CMOS
Shutter	global
Native Resolution	640 x 480 pixels
Scan Area	4.74 mm x 3.55 mm
Pixel Size	7.4 μm x 7.4 μm

Data Quality

@ 20 °C, gain = 1, exposure time = 32 msec

Readout Noise (σ)	< 0.5 LSB (8Bit) typical
Dynamic Range	typical > 55 dB

Acquisition Formats

Image Formats	Format	Resolution	Frame Rate	t_{readout}
	Full Frame	640 x 480	376 fps	2.67 msec
Pixel Formats	Mono8, Mono12, Mono12 Packed			
Partial Scan	True Partial Scan, Region of Interest (ROI) arbitrary			

Image Pre-Processing

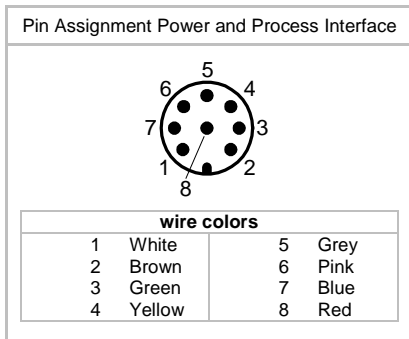
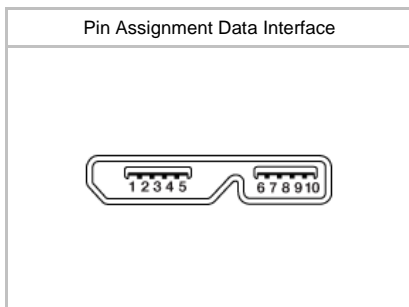
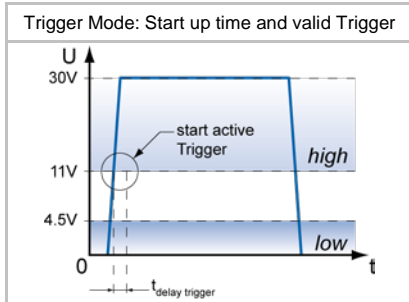
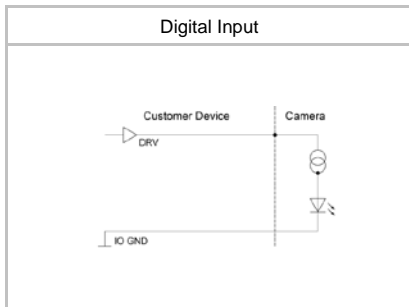
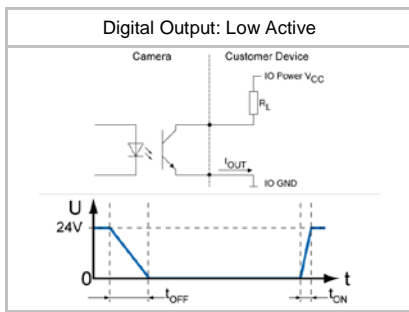
Analog Controls	Exposure Time (15 μsec ... 1 sec Step Size 1 μsec) Gain (0...18 dB), Offset (0 ... 255 LSB 12 bit),
Gamma Correction	Gamma (0.1 ... 2 available if LUT is enabled)
LUT	Luminance (12 bit)
Color Models	Mono
Color Tolerance	Only on Color Cameras
Color Processing	Only on Color Cameras
Color Adjustment	Only on Color Cameras
Binning Horizontal	1 or 2
Binning Vertical	1 or 2
Image Flipping	Horizontal, vertical
Defect Pixel Correction	via Defect Pixel List with up to 511 Pixel Coordinates

Process Synchronization

Modes	Free Running, Trigger
Free Running	Continuous or Adjustable Acquisition Frame Rate (0.01 ... 5730 Hz)
Trigger Sources	Hardware, Software, All or Off
Trigger Delay	0 ... 2 sec, Tracking and buffering of up to 256 triggers
Sequencer Characteristics	up to 128 sets of parameters, up to 65536 loop passes, up to 65536 repetitions of sets of parameters, up to 65536 images per trigger event
Sequencer Parameters	Exposure Time, Gain Factor, Output Line, ROI Offset x, ROI offset y
External Flash Sync	via Exposure Active $t_{\text{delay flash}} \leq 3 \mu\text{sec}$, $t_{\text{duration}} = t_{\text{exposure}}$

Digital I/Os

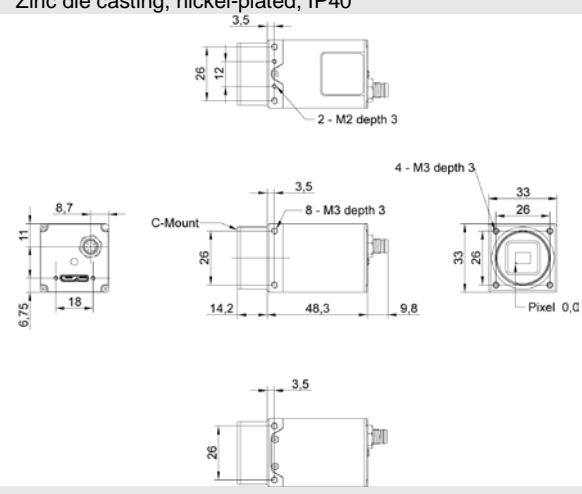
Lines	Input: Line 0, Output: Line1, Line 2, Line 3
Circuit Times	Output: $t_{\text{ON}} = \text{typ. } 3 \mu\text{sec}$ $t_{\text{OFF}} = \text{typ. } 40 \mu\text{sec}$
Output Sources	Off, ExposureActive, Line 0, Timer1 ... 3, ReadoutActive, User0 ... 2, TriggerReady, TriggerOverlapped, TriggerSkipped, Sequencer Output 0 ... 2
Line Debouncer	Low and high signal separately selectable Debouncing Time 0 ... 5 msec, Step Size: 1 μsec



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	6 – MicB_SSTX-
		2 – D-	7 – MicB_SSTX+
		3 – D+	8 – GND_DRAIN
		4 – ID	9 – MicB_SSRX-
		5 – GND	10 – MicB_SSRX+
Process Interface	Connector:	M8/8-pin (SACC-DSI-M8FS-8CONM10-L180 SH)	
	Assignment:	1 – OUT3 (Line2)	5 – IO Power VCC
		2 – not connected	6 – OUT1 (Line3)
		3 – IN1 (Line0)	7 – not connected
		4 – IO GND	8 – OUT2 (Line1)

Mechanical Data

Housing	Zinc die casting, nickel-plated, IP40
Dimensions	
Weight	140 g

Optical Data

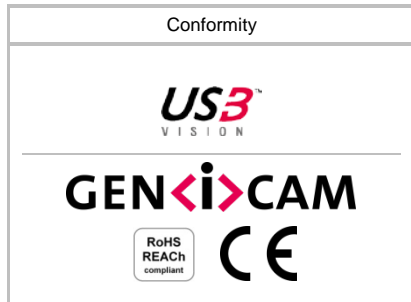
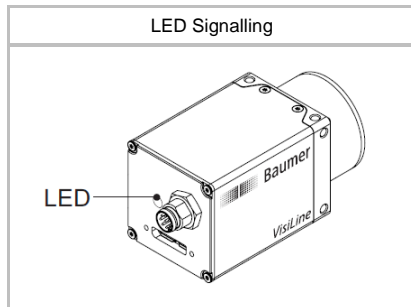
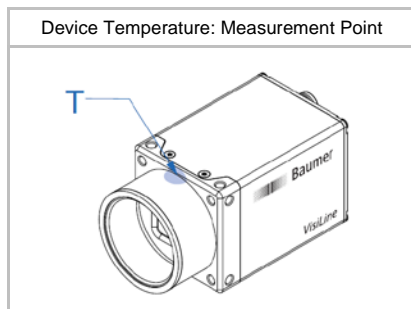
Lens Mount	C-Mount
Optical Filter	Dust Protection Glass

Electrical Data

Power Supply (ext.)	bus powered via USB3.0 interface		
Power Consumption	2.34W @ 376 fps		
Digital Input	$U_{IN(low)}$:	0.0 ... 4.5 VDC	
	$U_{IN(high)}$:	11.0 ... 30.0 VDC	
	I_{IN} :	6.0 ... 10 mA	
	min. Impulse Length:	2.0 μ sec	
	Trigger Delay out of treadout:	1.0 μ sec	
	max. Trigger Delay during treadout:	14.0 μ sec	
Digital Output	U_{EXT} :	5 ... 30 V DC	
	I_{OUT} :	max. 50 mA	

LED Signalling

LED	Green	USB3.0
	Green flash	Transmitting
	Yellow	USB2.0 (settings possible, no image)



Environmental Data

Storage Temperature	-10 °C ... +70 °C
Operating Temperature	+5°C ... +50°C
Device Temperature	T _{max} = 50 °C @ Measurement Point
Humidity	10 % ... 90 % non-condensing

Interface Data

Interface	USB3.0	5000 Mbits/sec
Image Buffer	16 Images	
USB Vendor ID / Product ID	0x2825 / 0x0122	

USB 3 Vision® Features

Events Transmission via Asynchronous Message Channel	EventLost, EventDiscarded, Line0RisingEdge, Line0FallingEdge, Line1RisingEdge, Line1FallingEdge, Line2RisingEdge, Line2FallingEdge, Line3RisingEdge, Line3FallingEdge, ExposureStart, ExposureEnd, FrameStart, FrameEnd, TriggerReady, TriggerOverlapped, TriggerSkipped
Frame Counter	up to 2 ³²
Payload Size	0 ... 614.672Byte
Timestamp	64 bit
USB3 Vision	v1.0

GeniCam™ Features

Timer	Timer Selector: Timer 1 ... 3 TimerTriggerSource: Line0, SoftwareTrigger, ExposureStart, ExposureEnd, FrameStart, FrameEnd, TriggerSkipped, Off TimerDelay: 0 µsec ... 2 sec, Step Size: 1 µsec TimerDuration: 10 µsec ... 2 sec, Step Size: 1 µsec
User Sets	Factory Settings: UserSet0 (read only) Freely Programmable: UserSet1, UserSet2, UserSet3 Parameters: any user definable Parameter
Acquisition Abort	Delay up to 2.65 msec
SFNC Version	v2.0

Factory Settings after Start-Up

Operation Mode	Free Running
Analog Controls	Exposure Time: 4 msec, Gain: 0 dB, Offset: 0
Pixel Format	Mono8
Partial Scan	Off
Acquisition Frame Rate	Off
Timer	Off
Defect Pixel Correction	On
Digital Input	Line0, invert = false, trigger source = All
Digital Output	Line1, Line 2, Line 3, invert = false, line source = Off