Datasheet | VCS2000 series industrial camera

Industrial camera for machine vision



NOTE! The technical data is subject to tolerances and may vary slightly in individual cases. Minor deviations should not be considered errors.

Tab. 1: General technical data

General technical data	Value
Category/Version	area scan camera
Power supply	EtherCAT mode: EtherCAT P; GigE Vision® mode: 24 V DC (-15%...+20%)
Synchronization	EtherCAT mode: DC timestamp and trigger bit; GigE Vision® mode: digital input
Image output	GigE Vision® 2.2 supported via Ethernet
Transmission rate	1 Gbit/s, 2.5 Gbit/s
Exposure time	14 µs...4.19 s (depending on the model)
Switch-on time until ready for operation	12...20 s (depending on the model)
Ethernet	1000/2500BASE-T
Connection technology	M8, socket, 4-pin, P-coded; M12, socket, 8-pin, X-coded
Shutter type	global shutter
Sensor type	area sensor
Lens mount	C mount
Dimensions (W x H x D)	72 mm x 72 mm x 38.4 mm
Weight	360 g (excluding lens and lens protection tube)
Material	anodized aluminum
Protection rating	IP30 with lens, without lens protection tube and connector; IP65/67 with lens, lens protection tube, and connector
Operating temperature range	0...60°C

General technical data	Value
Storage temperature	-20...+80°C
Approvals/markings	CE, UKCA, UL (in preparation)

Tab. 2: Product-specific technical data VCS2000 and VCS2020, spectral sensitivity monochrome

Product-specific technical data	VCS2000-0200	VCS2000-0300	VCS2000-0500	VCS2020-0800	VCS2020-1200
Number of pixels	2.3 MP	3.1 MP	5.0 MP	8.1 MP	12.4 MP
Sensor format	1/2.3" (7.8 mm)	1/1.8" (8.8 mm)	2/3" (11 mm)	2/3" (11 mm)	1/1.1" (14 mm)
Pixel size	3.45 µm	3.45 µm	3.45 µm	2.74 µm	2.74 µm
Pixel format	Mono8, Mono10, Mono12, Mono12p				
Bit depth	8-bit, 10-bit, 12-bit	12-bit	12-bit	8-bit, 12-bit	8-bit, 12-bit
Max. frame rate	127 fps	55 fps	35 fps	32 fps	21 fps
Resolution	1920 x 1200	2048 x 1536	2464 x 2048	2856 x 2848	4128 x 3008
Image sensor	Sony IMX392LLR	Sony IMX265LLR	Sony IMX264LLR	Sony IMX566AAMJ	Sony IMX565AAMJ
Max. power consumption	9 W				
Decimation	yes				
Binning	yes	no	no	yes	yes
ROI regions	1				

Tab. 3: Product-specific technical data VCS2001 and VCS2021, spectral sensitivity color

Product-specific technical data	VCS2001-0200	VCS2001-0300	VCS2001-0500	VCS2021-0800	VCS2021-1200
Number of pixels	2.3 MP	3.1 MP	5.0 MP	8.1 MP	12.4 MP
Sensor format	1/2.3" (7.8 mm)	1/1.8" (8.8 mm)	2/3" (11 mm)	2/3" (11 mm)	1/1.1" (14 mm)
Pixel size	3.45 µm	3.45 µm	3.45 µm	2.74 µm	2.74 µm
Pixel format	BayerRG8, BayerRG10, BayerRG12, BayerRG12p				
Bit depth	8-bit, 10-bit, 12-bit	12-bit	12-bit	8-bit, 12-bit	8-bit, 12-bit
Max. frame rate	127 fps	55 fps	35 fps	32 fps	21 fps
Resolution	1920 x 1200	2048 x 1536	2464 x 2048	2856 x 2848	4128 x 3008
Image sensor	Sony IMX392LQR	Sony IMX265LQR	Sony IMX264LQR	Sony IMX566AAQJ	Sony IMX565AAQJ
Max. power consumption	9 W				
Decimation	yes				
Binning	no				
ROI regions	1				

Tab. 4: Product-specific technical data VCS2030, spectral sensitivity monochrome

Product-specific technical data	VCS2030-0500	VCS2030-1600	VCS2030-2000	VCS2030-2400
Number of pixels	5.1 MP	16.2 MP	20.4 MP	24.6 MP
Sensor format	1/1.8" (8.8 mm)	1.1" (16.8 mm)	1.1" (17.5 mm)	1.2" (19.3 mm)
Pixel size	2.74 µm	2.74 µm	2.74 µm	2.74 µm
Pixel format	Mono8, Mono10, Mono12, Mono12p			
Bit depth	8-bit, 12-bit	8-bit, 12-bit	8-bit, 12-bit	8-bit, 12-bit
Max. frame rate	59 fps	19 fps	15 fps	12 fps
Resolution	2472 x 2064	5328 x 3040	4512 x 4512	5328 x 4608
Image sensor	Sony IMX547AAMJ	Sony IMX542AAMJ	Sony IMX541AAMJ	Sony IMX540AAMJ
Max. power consumption	9 W	9 W	9 W	10 W
Decimation	yes			
Binning	yes			
ROI regions	1			

Tab. 5: Product-specific technical data VCS2031, spectral sensitivity color

Product-specific technical data	VCS2031-0500	VCS2031-1600	VCS2031-2000	VCS2031-2400
Number of pixels	5.1 MP	16.2 MP	20.4 MP	24.6 MP
Sensor format	1/1.8" (8.8 mm)	1.1" (16.8 mm)	1.1" (17.5 mm)	1.2" (19.3 mm)
Pixel size	2.74 µm	2.74 µm	2.74 µm	2.74 µm
Pixel format	BayerRG8, BayerRG10, BayerRG12, BayerRG12p			
Bit depth	8-bit, 12-bit	8-bit, 12-bit	8-bit, 12-bit	8-bit, 12-bit
Max. frame rate	59 fps	19 fps	15 fps	12 fps
Resolution	2472 x 2064	5328 x 3040	4512 x 4512	5328 x 4608
Image sensor	Sony IMX547AAQJ	Sony IMX542AAQJ	Sony IMX541AAQJ	Sony IMX540AAQJ
Max. power consumption	9 W	9 W	9 W	10 W
Decimation	yes			
Binning	no			
ROI regions	1			

Tab. 6: Product-specific technical data VCS2002 and VCS2003, spectral sensitivity monochrome and color

Product-specific technical data	VCS2002-0500[1]	VCS2003-0500[2]
Number of pixels	5.0 MP	
Sensor format	2/3" (11 mm)	
Pixel size	3.45 µm	
Pixel format[3]	Mono8, Mono10, Mono12, Mono12p, Polarized_90_45_135_0_Mono8, Polarized_90_45_135_0_Mono10, Polarized_90_45_135_0_Mono12, Polarized_90_45_135_0_Mono12p	Mono8, Mono10, Mono12, Mono12p, Polarized_45_90_0_135_BayerRG8, Polarized_45_90_0_135_BayerRG10, Polarized_45_90_0_135_BayerRG12, Polarized_45_90_0_135_BayerRG12p
Bit depth	12-bit	
Max. frame rate	35 fps	
Resolution	2464 x 2048	
Image sensor	Sony IMX264MZR	Sony IMX264MYR
Max. power consumption	9 W	
Decimation	yes	
Binning	no	
ROI regions	1	

[1] polarization/monochrome
[2] Polarization/color; for compatibility reasons, the monochrome pixel formats are included
[3] pixel formats resulting from a horizontal or vertical change in the scan direction (mirroring) are also supported. These pixel formats are not listed in the table.

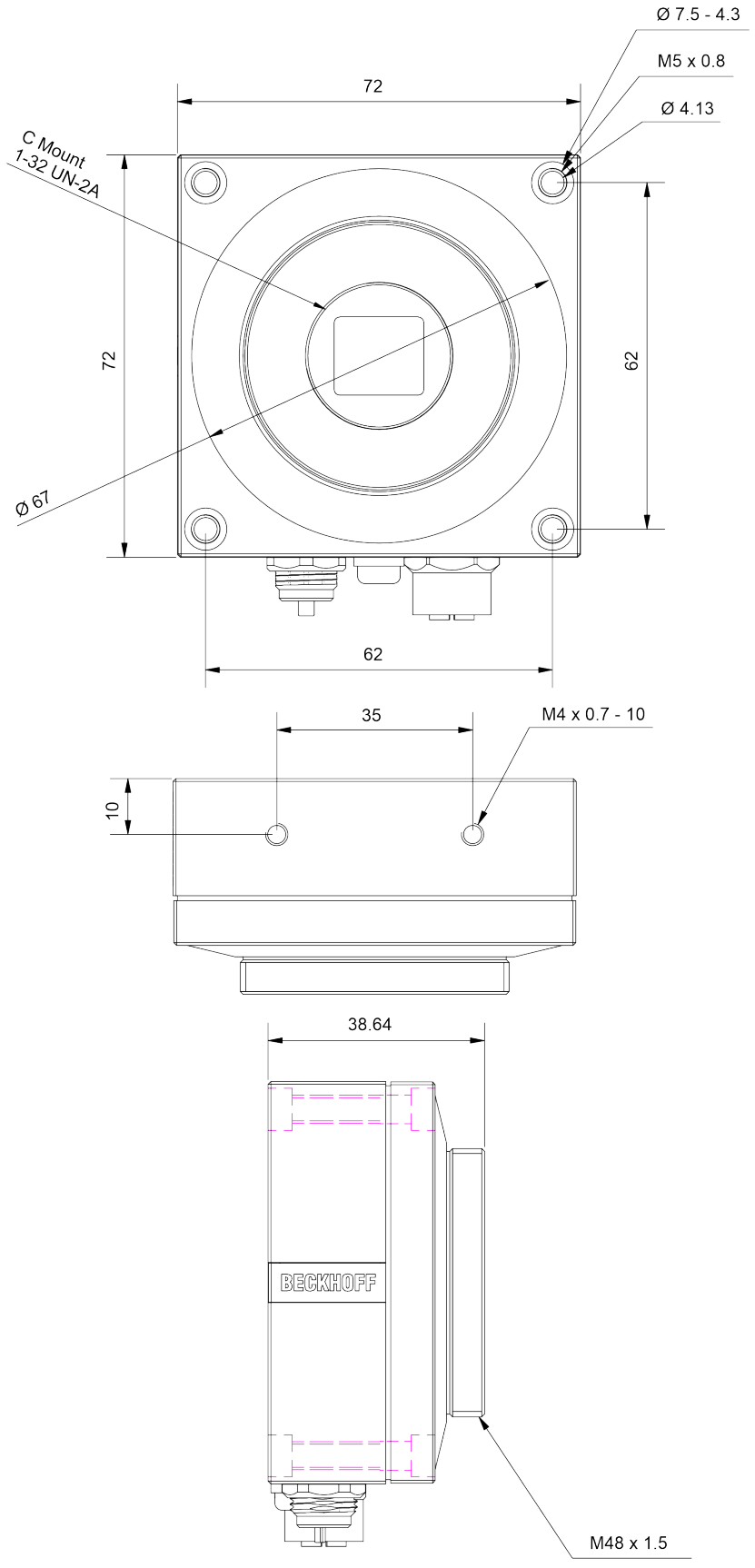


Fig. 1: Dimensions of the VCS2000 series (in mm)

M8 socket pin assignment

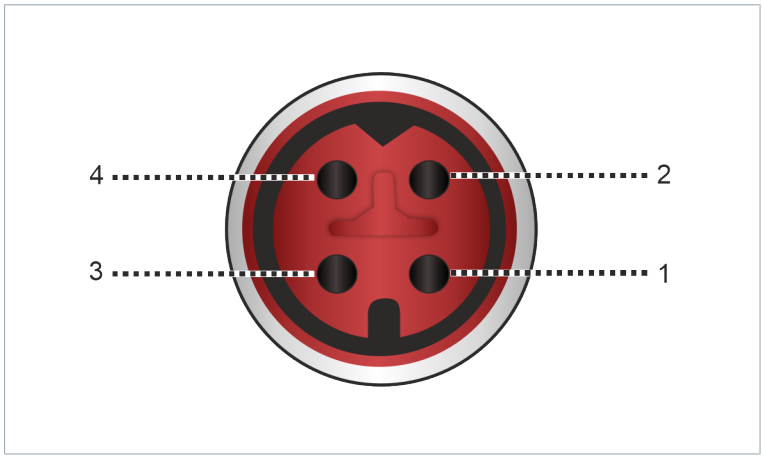


Fig. 2: Pin layout and contact arrangement of the P-coded M8 socket (top view)

Tab. 7: Electrical pin assignment for the P-coded M8 socket and core colors

Number/contact	Signal	Voltage	Wire color[1]
1	Tx +	GND_S	yellow
2	Rx +	GND_P	white
3	Rx -	U_P: peripheral voltage, +24 V DC	blue
4	Tx -	U_S: System and sensor supply, +24 V DC	orange

The camera housing serves as EMC shielding.
When the camera is operating in GigE Vision® mode, pins 4 (24 V+) and 1 (GND) are used for power supply. Pins 3 and 2 can be used as potential-free trigger input.
For example, you can use the "ZK7000-0101-0xxx" cable (EtherCAT P cable, AWG22, PUR, drag-chain suitable) to connect to the M8 socket.
You can find compatible cables on the ▶Beckhoff web page.

M12 socket pin assignment

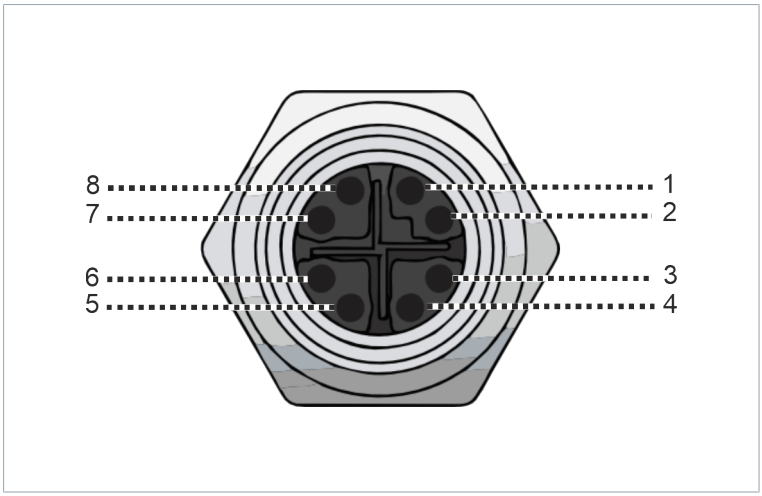


Fig. 3: Pin layout and contact arrangement of the X-coded M12 socket (top view)

Tab. 8: Pin assignment for the X-coded M12 socket and core colors

Number/contact	1000BASE-T Signal ID	Wire color
1	DA+	white-orange
2	DA–	orange
3	DB+	white-green
4	DB–	brown
5	DD+	white-blue
6	DD–	blue
7	DC–	white-brown
8	DC+	green

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