

SONY.



XCL Series

Digital Cameras



www.sony.com/videocameras

Seeing is Believing with Sony XCL Series Digital Cameras. Offering a Choice of Resolutions for a Wide Range of Machine Vision Applications.

Sony's XCL Series consists of five cameras with various resolutions – from 5M to VGA. All five of these cameras are equipped with the industry standard digital Camera Link™ interface, enabling the capture of high-speed, high resolution images while simplifying connectivity to machine vision systems with its standard 26 pin connector.

The newest member of the XCL series is Sony's ultra-high 5 Mega Pixel Resolution XCL-5000 Camera. The XCL-5000 camera incorporates a new Sony 2/3-type progressive scan CCD sensor and has an incredible 2,456 x 2,058 effective pixels at 15 frames per second. This camera also supports up to 12-bit bit depth (selectable 8b, 10b or 12b) for advanced image processing and analysis. The XCL-5000 includes a multipurpose DSP for gamma correction, LUTs, edge enhancement and many other useful functions.

Rounding out the XCL Series are the XCL-U1000 (black and white) and XCL-U1000C (color) cameras incorporating a 1/1.8-type progressive scan CCD with UXGA resolution (1,600 x 1,200 pixels). In addition, the XCL-U1000C camera uses a CCD with a color "mask" (commonly called a "Bayer filter") and a DSP to provide uncompressed, high resolution, digital color images and a direct VGA display output option.

The compact and lightweight XCL-V500 and XCL-X700 cameras featuring a 1/3-type progressive scan CCD that captures high-quality monochrome images at a high frame rate.

All models incorporate a variety of convenient features such as partial scan and external trigger function allowing for the clear capture of fast moving objects or still images in low light environments. Sony's XCL Series are the ideal solution for today's wide range of machine vision applications.

FEATURES

XCL-5000

Black and White Digital Video Camera

Ultra High-Resolution Image Capture

- 5 Mega Pixel Resolution Images (2,448 x 2,050 pixels), captures video at 15 fps

2/3-type Progressive Scanning CCD with Square Pixels

Effective Picture Elements

- 2,456(H) x 2,058(V)
- C mount lens

High Speed Image Output

- 12-bit (default)/8-bit/10-bit processing (selectable)

High Sensitivity

- 400 lx @ F 5.6

Compact and Lightweight

- 1 ³/₄ x 1 ³/₄ x 2 ³/₈ inches (44 (W) x 44 (H) x 57.5 (D) mm), 4.8 oz (135 g)

External Trigger Shutter

- 2 to 1/10,000 s

Binning Function

Built-in Real Time 3 x 3 Image Pre-Processing Filter

XCL-U1000

Black and White Digital Video Camera

XCL-U1000C

Color Digital Video Camera

High-resolution Image Capture

- UXGA image (1,600 x 1,200 pixels), captures video at 15 fps

1/1.8-type Progressive Scanning CCD with Square Pixels

Effective Picture Elements

- 1,628(H) x 1,236(V)

High Sensitivity

- 400 lx @ F 5.6 (XCL-U1000)
- 2,000 lx @ F8 (XCL-U1000C)

Monitor Output

Compact and Lightweight

- 2 ¹/₄ x 1 ³/₄ x 3 ³/₄ inches (56 (W) x 44 (H) x 95 (D) mm), 9 oz (250 g)

External Trigger Shutter

- 1/15 to 1/10,000 s

Binning Function (XCL-U1000)

White Balance (XCL-U1000C)

- Auto/Manual/Pre-set (selectable)

Matrix function for accurate color reproduction (XCL-U1000C)

XCL-V500

Black and White Digital Video Camera

XCL-X700

Black and White Digital Video Camera

High Scanning Rate

- VGA image (648 x 494 pixels), captures video at 60 fps (XCL-V500)
- XGA image (1,024 x 768 pixels), captures video at 30 fps (XCL-X700)

1/3-type Progressive Scanning CCD with Square Pixels

Effective Picture Elements

- 659(H) x 494(V) (XCL-V500)
- 1034(H) x 779(V) (XCL-X700)

High Sensitivity

- 400 lx @ F 5.6

Compact and Lightweight

- 1 3/16 x 1 3/16 x 1 3/16 inches (29 (W) x 29 (H) x 30 (D) mm), 2 oz (55 g)

External Trigger Shutter

- 1/4 to 1/100,000 s

Synchronization Signal

- Internal/External (HD/VD)

Binning Function

COMMON FEATURES

Camera Link Interface

C-mount Lens

Partial Scanning

High Shock and Vibration Resistance

PIN ASSIGNMENT

XCL-5000

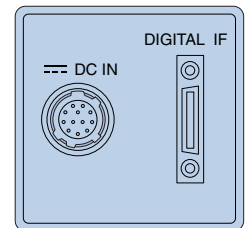
12-pin connector

Pin No.	
1	GND
2	+12V DC
3	GND
4	NC
5	GND
6	NC
7	NC
8	GND
9	NC
10	DVAL Output, Exposure pulse output, GND (selectable)
11	Trigger pulse input
12	GND

XCL-5000/XCL-U1000/XCL-U1000C

26-pin connector (Digital IF)

Pin No.		Pin No.	
1	INNER_SHIELD (GND)	14	INNER_SHIELD (GND)
2	X0- output (signal)	15	X0+ output (signal)
3	X1- output (signal)	16	X1+ output (signal)
4	X2- output (signal)	17	X2+ output (signal)
5	XCLK- output (signal)	18	XCLK+ output (signal)
6	X3- output (signal)	19	X3+ output (signal)
7	SerTC+ (signal)	20	SerTC- (signal)
8	SerTFG- (signal)	21	SerTFG+ (signal)
9	TRIG- input (signal)	22	TRIG+ input (signal)
10	NC	23	NC
11	NC	24	NC
12	NC	25	NC
13	INNER_SHIELD (GND)	26	INNER_SHIELD (GND)



XCL-5000

XCL-U1000/XCL-U1000C

12-pin connector

15-pin connector

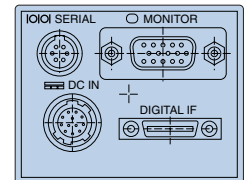
6-pin connector

Pin No.		Pin No.		Pin No.	
1	GND	1	R output	1	TXD
2	+12V DC	2	G output	2	RXD
3	GND	3	B output	3	GND
4	NC	4	NC	4	NC
5	GND	5	GND	5	NC
6	NC	6	GND	6	NC
7	NC	7	GND		
8	GND	8	GND		
9	NC	9	NC		
10	Exposure pulse output	10	GND		
11	Trigger pulse input	11	NC		
12	GND	12	NC		
		13	HD output		
		14	VD output		
		15	NC		

XCL-V500/XCL-X700

26-pin connector (Digital IF)

Pin No.		Pin No.	
1	INNER_SHIELD (GND)	14	INNER_SHIELD (GND)
2	X0- output (signal)	15	X0+ output (signal)
3	X1- output (signal)	16	X1+ output (signal)
4	X2- output (signal)	17	X2+ output (signal)
5	XCLK- output (signal)	18	XCLK+ output (signal)
6	X3- output (signal)	19	X3+ output (signal)
7	SerTC+ (signal)	20	SerTC- (signal)
8	SerTFG- (signal)	21	SerTFG+ (signal)
9	TRIG- input (signal)	22	TRIG+ input (signal)
10	HD (+) input (signal)	23	HD (-) input (signal)
11	VD (-) input (signal)	24	VD (+) input (signal)
12	CLOCK (+)input (signal)	25	CLOCK (-) input (signal)
13	INNER_SHIELD (GND)	26	INNER_SHIELD (GND)

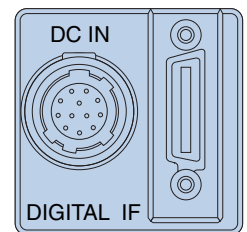


XCL-U1000/XCL-U1000C

XCL-V500/XCL-X700

12-pin connector

Pin No.	Restart/Reset	External Trigger Shutter	Pin No.	Camera Sync Signal Output	Pin No.	External Sync Mode (HD/VD)
1	GND	GND	1	GND	1	GND
2	+12V DC	+12V DC	2	+12V DC	2	+12V DC
3	-	-	3	-	3	-
4	CLOCK (+) input (signal)	CLOCK (+) input (signal)	4	CLOCK (+) input (signal)	4	CLOCK (+) input (signal)
5	HD input (GND)	HD input (GND)	5	HD output (GND)	5	HD input (GND)
6	HD input (signal)	HD input (signal)	6	HD output (signal)	6	HD input (signal)
7	RE-SET	VD input (signal)	7	VD output (signal)	7	VD input (signal)
8	-	-	8	-	8	-
9	CLOCK (-) input (signal)	CLOCK (-) input (signal)	9	CLOCK (-) input (signal)	9	CLOCK (-) input (signal)
10	-	WEN output (signal)	10	-	10	-
11	-	Trigger pulse input (signal)	11	-	11	-
12	RE-SET (GND)	VD input (GND)	12	VD output (GND)	12	VD Input (GND)

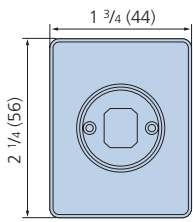


XCL-V500/XCL-X700

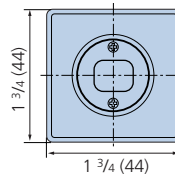
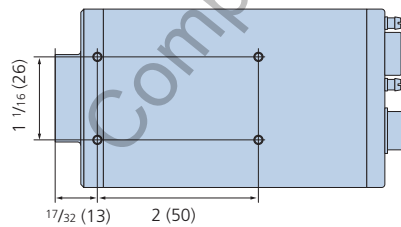
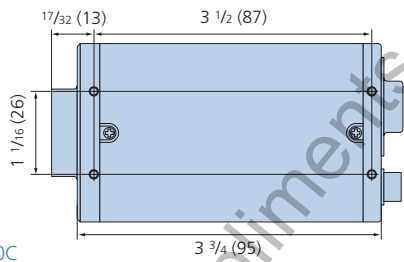
SPECIFICATIONS

	XCL-5000	XCL-U1000	XCL-U1000C	XCL-V500	XCL-X700
Image device	2/3-type PS IT CCD	1/1.8-type PS IT CCD		1/3-type PS IT CCD	
Effective picture elements (HxV)	2456 x 2058	1628 x 1236		659 x 494	1034 x 779
Output image size	2448 x 2050 pixels	1,600 x 1,200 pixels		648 x 494 pixels	1,024 x 768 pixels
Cell size (HxV)	3.45 x 3.45 μm	4.4 x 4.4 μm		7.4 x 7.4 μm	4.65 x 4.65 μm
Sensitivity	F5.6 at 400 lx		F8 at 2000 lx	F5.6 at 400 lx	
Sync system	Internal			Internal/External (HD/VD)	
Lens mount	C mount				
Frame rate	15 fps			60 fps	30 fps
Output data clock	80 MHz	36 MHz		24.55 MHz	29.5 MHz
Gain	0 to +18 dB				
Gamma	MANUAL/OFF/DEFAULT (selectable)	ON/1 (fixed)		1 (fixed)	
Trigger shutter	2 to 1/10,000 s	1/15 to 1/10,000 s		1/4 to 1/100,000 s	
Partial scan	Vertical ON/OFF				
Binning	Vertical +2Line				
Expansion signal output	DVAL/EXPOSURE/GND (selectable)	-			
Minimum illumination	1 lx (Gain +18 dB, F1.4)		4 lx (Gain +18 dB, F1.4)	1 lx (Gain +18 dB, F1.4)	
Video output	Digital (Camera Link)		Digital (Camera Link), RGB 8-bit	Digital (Camera Link)	
Detail	ON/OFF				
Matrix	-		ON/OFF	-	
3x3 image filter	ON/OFF				
White balance	-		Preset, Manual, AWB	-	
Power requirements	DC12 V				
Power consumption	3.6 W	5.5 W or less		2.0 W or less	2.2 W or less
Dimensions (WxHxD)	1 3/4 x 1 3/4 x 2 3/8 inches (44 x 44 x 57.5 mm)	1 3/4 x 2 1/4 x 3 3/4 inches (44 x 56 x 95 mm)		1 3/16 x 1 3/16 x 1 3/16 inches (29 x 29 x 30 mm)	
Weight	4.8 oz (135 g)	9 oz (250 g)		2 oz (55 g)	
Operating temperature	23 to 113 °F (-5 to 45 °C)				
Storage temperature	-22 to 140 °F (30 to 60 °C)				
Operating humidity	20 to 80 % (no condensation)				
Storage humidity	20 to 95 % (no condensation)				
Vibration resistance	10 G (20 Hz to 200 Hz)				
Shock resistance	70 G				
Supplied accessories	Lens mount cap (1), Operating instructions				

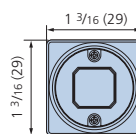
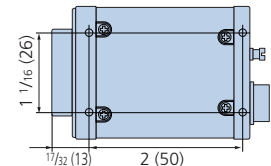
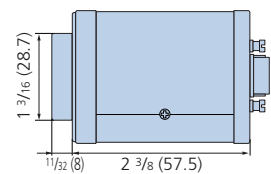
DIMENSIONS



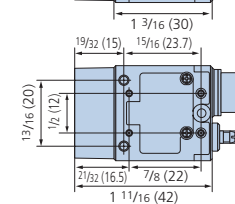
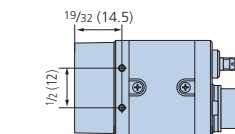
XCL-U1000/XCL-U1000C



XCL-5000



XCL-V500/XCL-X700



Unit: inches (mm)

SONY

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