XC-HR Series

B/W Progressive Scan Cameras

SONY

For Demanding Applications That Require High Frame Rates and High Resolution, Choose Sony's XC-HR Series of Progressive Scan Cameras

Joining Sony's popular XC-HR Camera Series is the new high-speed/high-resolution XC-HR90. This new camera incorporates a 1/3" Progressive Scan IT CCD with SXGA resolution of 1280 x 960 pixels at a selectable frame rate of 30 or 15 full frames per second (fps). The XC-HR90 achieves high-rate scanning up to 204.8 fps with 60 effective lines, selectable from 16 vertical divisions. Camera settings can be made via the camera's RS-232C interface (12-pin connector).

Sony's complete line-up of high speed cameras include the XC-HR50, XC-HR57, XC-HR58, and XC-HR70. All of these cameras feature the same compact body enabling them to be easily interchanged to meet your various application requirements and are ideal for space restricted areas. The XC-HR57 and XC-HR58 cameras both incorporate a 1/2" Progressive Scan IT CCD. The XC-HR57 features VGA resolution of 648 x 494 pixels at 60 full fps, and the XC-HR58 features SVGA resolution of 767 x 580 pixels at 50 full fps. Both the XC-HR50 and XC-HR70 cameras incorporate a 1/3" Progressive Scan IT CCD. The XC-HR50 features VGA resolution of 648 x 494 pixels at 60 full fps, and the XC-HR70 provides XGA resolution of 1024 x 768 pixels at 30 full fps.

In addition, the XC-HR camera series has a high-rate scanning function that increases their vertical scanning frequency so that images can be captured from 120 to 240 fps depending on the camera model.

Combining high-resolution and high-speed image capture capabilities in a compact, robust body, Sony's XC-HR Camera Series are ideal for demanding applications such as semiconductor production and high-speed assembly lines.

COMMON FEATURES

High-Resolution Image Capturing

High-Rate Scanning

Synchronization: Internal/External (HD/VD)

Vertical Binning Function
By combining the image data of every two lines vertically, these cameras can increase the frame rate, which minimizes image processing time.

External Trigger Shutter
Allows accurate image capture of fast-moving objects through shutter speeds of 1/4 to 1/100,000 sec.

High Shock and Vibration Tolerance

RoHS Compliance

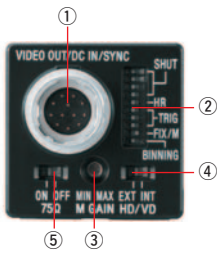
Compact, Lightweight Body

C-mount

REAR PANELS

XC-HR90

XC-HR50/HR57/HR58/HR70



① 12-pin connector
② Shutter speed/Mode setting DIP switch
③ Manual Gain adjustment
④ HD/VD signal I/O switch
⑤ 75^ termination switch
⑥ Mode setting DIP switch
(75^ termination, HD/VD signal I/O, 30 fps/15 fps, RS-232C ON/OFF)

SPECIFIC CAMERA KEY FEATURES

XC-HR90

- 1/3-type progressive scan CCD
- SXGA resolution (1,280 x 960 pixels) image capturing at a speed of 30 or 15 full fps.
- High-rate scanning
  - Readout of center 240 lines at 95.8 fps (set using dip switches)
  - Readout of 60 effective lines selectable from 16 vertical divisions at up to 204.8 fps.
- Horizontal resolution: 960 TV lines
- Partial scan controlled by VD pulse length
- Minimum illumination: 1.0 lx at F1.4
- High S/N ratio: 56 dB
- Electronic shutter: 1/100 to 1/100,000 sec.

XC-HR50

- 1/3-type progressive scan CCD
- VGA resolution (648 x 494 pixels) image capturing at a speed of 60 full fps.
- High-rate scanning of up to 240 partial fps. (100 effective lines at restart/reset ON, binning OFF)
- Horizontal resolution: 500 TV lines
- Partial scan controlled by VD pulse length
- Minimum illumination: 1.0 lx at F1.4
- High S/N ratio: 58 dB
- Electronic shutter: 1/100 to 1/30,000 sec.

XC-HR57

- 1/2-type progressive scan CCD
- VGA resolution (648 x 494 pixels) image capturing at a speed of 60 full fps.
- High-rate scanning of up to 240 partial fps. (100 effective lines at restart/reset ON, binning OFF)
- Horizontal resolution: 500 TV lines
- Partial scan controlled by VD pulse length
- Minimum illumination: 1.0 lx at F1.4
- High S/N ratio: 58 dB
- Electronic shutter: 1/100 to 1/30,000 sec.

XC-HR58

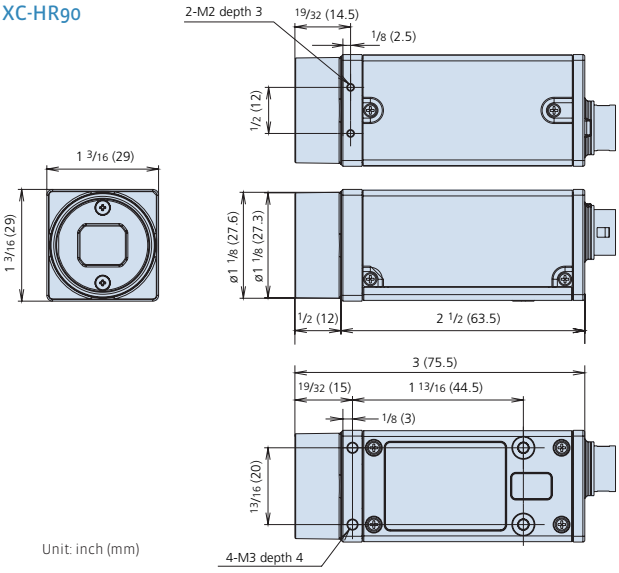
- 1/2-type progressive scan CCD
- High SVGA resolution (767 x 580 pixels) image capturing at a speed of 50 full fps.
- High-rate scanning of up to 200 partial fps. (90 effective lines at restart/reset ON, binning OFF)
- Horizontal resolution: 600 TV lines
- Partial scan controlled by VD pulse length
- Minimum illumination: 1.0 lx at F1.4
- High S/N ratio: 56 dB
- Electronic shutter: 1/100 to 1/30,000 sec.

XC-HR70

- 1/3-type progressive scan CCD
- XGA resolution (1,024 x 768 pixels) image capturing at a speed of 29 full fps.
- High-rate scanning of up to 120 partial fps. (152 effective lines at restart/reset ON, binning OFF)
- Horizontal resolution: 800 TV lines
- Partial scan controlled by VD pulse length
- Minimum illumination: 1.0 lx at F1.8
- High S/N ratio: 56 dB
- Electronic shutter: 1/100 to 1/20,000 sec.

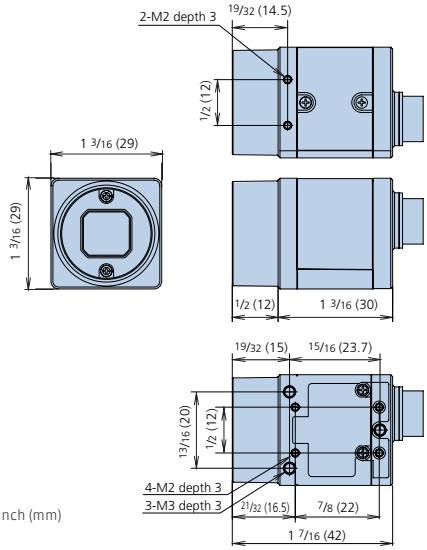
DIMENSIONS

XC-HR90

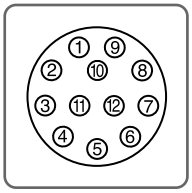


Unit: inch (mm)

XC-HR50/HR57/HR58/HR70



Unit: inch (mm)



PIN ASSIGNMENT

XC-HR90

Pin No.	Camera sync output	External sync mode	Restart/Reset mode	External trigger shutter mode
1	Ground			
2	+12 V DC			
3	Video output (Ground)			
4	Video output (Signal)			
5	HD output (Ground)	HD input (Ground)		
6	HD output (Signal)	HD input (Signal)		
7	VD output (Signal)	VD intput (Signal)	Reset (Signal)	VD intput (Signal)
8	Rx (RS-232C serial communication)			
9	Tx (RS-232C serial communication)			
10	–	–	–	WEN output (Signal)
11	–	–	–	Trigger pulse intput (Signal)
12	VD output (Ground)	VD input (Ground)	Reset (Ground)	Reset (Ground)

XC-HR50/HR57/HR58/HR70

Pin No.	Camera sync output	External sync mode	Restart/Reset mode	External trigger shutter mode
1	Ground			
2	+12 V DC			
3	Video output (Ground)			
4	Video output (Signal)			
5	HD output (Ground)	HD input (Ground)		
6	HD output (Signal)	HD input (Signal)		
7	VD output (Signal)	VD intput (Signal)	Reset (Signal)	VD intput (Signal)
8	–			
9	–			
10	–	–	–	WEN output (Signal)
11	–	–	–	Trigger pulse intput (Signal)
12	VD output (Ground)	VD input (Ground)	Reset (Ground)	Reset (Ground)

SPECIFICATIONS

	XC-HR50	XC-HR57	XC-HR58	XC-HR70	XC-HR90
Image device	1/3-type progressive scan IT CCD	1/2-type progressive scan IT CCD		1/3-type progressive scan IT CCD	
Effective picture elements	659 (H) x 494 (V)		782 (H) x 582 (V)	1,034 (H) x 779 (V)	1296 (H) x 966 (V)
Effective lines	648 (H) x 494 (V) - VGA		767 (H) x 580 (V) - SVGA	1,024 (H) x 768 (V) - XGA	1280 (H) x 960 (V) - SXGA
Cell size	7.4 µm (H) x 7.4 µm (V)	9.9 µm (H) x 9.9 µm (V)	8.3 µm (H) x 8.3 µm (V)	4.65 µm (H) x 4.65 µm (V)	3.75 µm (H) x 3.75 µm (V)
Scanning system	Progressive scan				
Output signal frequency	59.94 Hz (normal mode), 119.88 Hz (binning mode)		50.0 Hz (normal mode), 99.8 Hz (binning mode)	29.2 Hz (normal mode), 58.4 Hz (binning mode)	30.0 Hz (nomal, 30 fps mode) 15.0 Hz (nomal, 15 fps mode) 54.1 Hz (binning, 30 fps mode) 30.0Hz (binning, 15 fps mode)
Lens mount	C mount				
Flange back	17.526 mm				
Sync system	Internal/External (auto)				
External sync signal	HD/VD (2 to 5 Vp-p 75 ^)			HD/VD (2.5 to 5 Vp-p 75 Ω)	
Jitter	Less than 20 ns				
Video output	1.0 Vp-p, sync negative, 75 ^, unbalanced				
Horizontal resolution	500 TV lines		600 TV lines	800 TV lines	960 TV lines
Sensitivity	400 lx F 5.6 (γ = OFF, FIX GAIN (0dB))				
Minimum illumination	1lx (F 1.4, γ = OFF, GAIN +18dB)			1lx (F 1.8, γ = OFF, GAIN +18dB)	1lx (F 1.4, γ = OFF, GAIN +18dB)
S/N ratio	58 dB (0 dB GAIN)		56 dB (0 dB GAIN)		
Gain	Manual (0 to 18dB)/FIX (0dB) (adjustable on rear panel)				Manual (0 to +18dB)/FIX (0dB) (adjustable on rear panel or via RS-232C)
Gamma	OFF (fixed)				
White clip	820 mV ±70 mV (F1.4, FIX GAIN (0dB))			820 mV ±70 mV (F1.8, FIX GAIN (0dB))	
Shutter	Normal shutter, Restart/Reset(R/R), External trigger shutter (Mode 1/Mode 2)				
Normal shutter speed	1/100, 1/125, 1/250, 1/500, 1/1,000, 1/2,000, 1/4,000, 1/10,000, 1/15,000, 1/30,000 s			1/100, 1/125, 1/250, 1/500, 1/1,000, 1/2,000, 1/4,000, 1/10,000, 1/20,000 s	1/100, 1/125, 1/250, 1/500, 1/1,000, 1/2,000, 1/4,000, 1/10,000, 1/25,000, 1/50,000, 1/100,000 s
External trigger shutter speed	DIP switch settings: 1/100, 1/125, 1/250, 1/500, 1/1,000, 1/2,000, 1/4,000, 1/10,000, 1/25,000, 1/50,000, 1/100,000 s Trigger pulse width settings: 1/4 to 1/100,000 s				
External trigger	Polarity: +, Width: 2 µs to 250ms, Input impedance: 10 kΩ or more (H: +2 to +5.0V, L: 0 to 0.6V) Polarity: +, Width: 2 µs to 250ms,				Input impedance: 10 kΩ or more (H: +2.5 to +5.0V, L: 0 to 0.6V)
High-rate scanning	R/R mode binning off: max 240 fps (effective lines: 102 lines) binning on: max 362 fps (effective lines: 59 lines)		R/R mode binning off: max 200 fps (effective lines: 111 lines) binning on: max 300 fps (effective lines: 59 lines)	R/R mode binning off: max 120 fps (effective lines: 152 lines) binning on: max 180 fps (effective lines: 89 lines)	Readout of center 480 lines at 56 fps, Readout of center 240 lines at 95.8 fps (settable using DIP switches)
	External trigger shutter mode (MODE 1) binning off: max 240 fps (effective lines: 100 lines) binning on: max 362 fps (effective lines: 57 lines)		External trigger shutter mode (MODE 1) binning off: max 200 fps (effective lines: 109 lines) binning on: max 300 fps (effective lines: 57 lines)	External trigger shutter mode (MODE 1) binning off: max 120 fps (effective lines: 153 lines) binning on: max 180 fps (effective lines: 90 lines)	Readout of 60 effective lines selectable from 16 vertical divisions at max. 204.8 fps (settable via RS-232C)
Power requirements	DC 12 V (+10.5 V to +15 V)				
Power consumption	1.8 W		2.0 W		2.8 W
Dimensions	1 3/16 x 1 3/16 x 1 3/16 inches (29 (W) x 29 (H) x 30 (D) mm) (excluding protrusions)				1 3/16 x 1 3/16 x 2 1/2 inches (29 (W) x 29 (H) x 63.5 (D) mm) (excluding protrusions)
Weight	1.8 oz (50 g)				2.8 oz (80 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 (1)				

ACCESSORIES

	XC-HR50	XC-HR57	XC-HR58	XC-HR70	XC-HR90
Camera adaptor	DC-700/700CE				
12-pin camera cable	CCXC-12P02N (2 m)/12P05N (5 m)/12P10N (10 m)/12P25N (25 m)				
Tripod adaptor	VCT-333I				VCT-55I

SONY

image is everything™

IS-1154
MK10384V1

Printed in USA (11/06)