

# XC-E Series

B/W Video Camera Module  
TV Format



XC-ES50L/  
XC-ES50LCE

XC-ES50/XC-ES50CE  
XC-ES51/XC-ES51CE  
XC-ES30/XC-ES30CE

XC-EI50/XC-EI50CE  
XC-EI30/XC-EI30CE

XC-EU50/  
XC-EU50CE

**With dimensions of 29 x 29 x 32 mm\*, these cameras can easily be installed in places where installation was previously difficult for other larger cameras.**

The XC-E Series offer three different model ranges that only differ in spectral sensitivity as to suit various application environments. The XC-ES Series (XC-ES50/ES50CE, XC-ES50L/ES50LCE, XC-ES51/ES51CE and XC-ES30/ES30CE) are standard models for general use under visible light conditions. The XC-EI Series (XC-EI50/EI50CE and XC-EI30/EI30CE) offer excellent near-infrared sensitivity. Under low light conditions or when used with IR LED illumination systems, these cameras provide clear images. The XC-EU Series (XC-EU50/EU50CE) offer near-ultraviolet sensitivity in the i-line, or 365 nm, range. The short wavelength allows the XC-EU Series to capture very fine detail. All models have identical dimensions and controls, making them easy to interchange. A variety of settings are available for differing subject and lighting conditions. All camera control switches are accessible from the outside of the camera. Excellent vibration and shock characteristics make these cameras ideal for demanding machine vision applications.

\*The XC-ES50L/ES50LCE, which are L-type versions of the XC-ES50/ES50CE, measure 29 (W) x 42.5 (H) x 43.8 (D) mm

## IMAGE SENSING SOLUTIONS

The XC-E Series are compact, light-weight one-piece black and white cameras incorporating the latest 1/2 and 1/3 type Interline (IT) CCD which produces new levels of picture detail.

### Features

- **1/2 type IT CCD:** XC-ES50/ES50CE, XC-ES50L/XC-ES50LCE, XC-ES51/XC-ES51CE, XC-EI50/XC-EI50CE, XC-EU50/XC-EU50CE
- **1/3 type IT CCD:** XC-ES30/XC-ES30CE, XC-EI30/XC-EI30CE
- **Compact and light weight:**  
29 (W) x 29 (H) x 32 (D) mm, 50 g; except for XC-ES50L/XC-ES50LCE  
29 (W) x 42.5 (H) x 43.8 (D) mm, 110 g; XC-ES50L/XC-ES50LCE
- **Near-infrared sensitivity:**  
XC-EI50/XC-EI50CE, XC-EI30/EI30CE
- **Near-ultraviolet sensitivity:**  
XC-EU50/XC-EU50CE
- **Minimum illumination at F1.4:**  
0.3 lx: XC-ES50/XC-ES50CE, XC-ES30/XC-ES30CE  
3.0 lx: XC-ES50L/XC-ES50LCE  
0.1 lx: XC-EI50/XC-EI50CE  
0.2 lx: XC-ES51/XC-ES51CE, XC-EI30/XC-EI30CE
- **High S/N Ratio: 60 dB**
- **Electronic shutter function:** 1/100 to 1/10,000 s: EIA, 1/120 to 1/10,000 s: CCIR
- **Flexible trigger shutter function**
- **Scanning system: 2:1 interlaced**
- **Frame/field exposure**
- **Restart/reset function**
- **Synchronization: internal/external (HD/VD)**
- **High shock and vibration tolerance**

### Standard model

**XC-ES50/ES50CE**  
**XC-ES50L/ES50LCE**  
**XC-ES51/ES51CE**  
**XC-ES30/ES30CE**



#### ■ Applicable wavelength range



### Near IR model

**XC-EI50/EI50CE**  
**XC-EI30/EI30CE**



#### ■ Applicable wavelength range

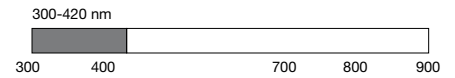


### UV model

**XC-EU50/EU50CE**



#### ■ Applicable wavelength range



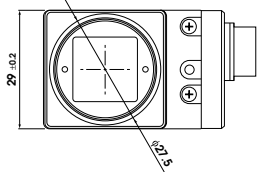
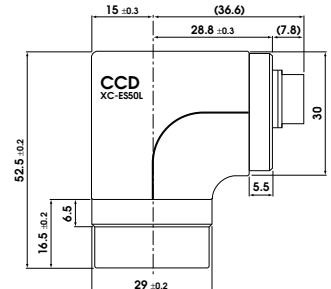
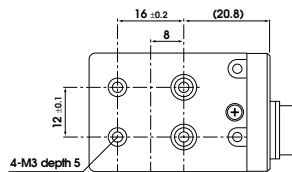
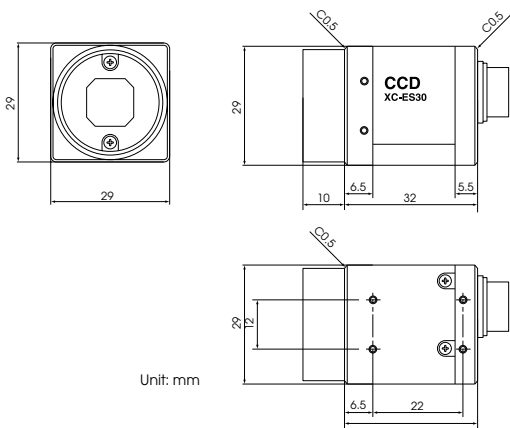
The XC-EU50/EU50CE models are compact and lightweight cameras that have near-ultraviolet sensitivity in the i-line, or 365 nm, range. Examples of typical application areas are PCB and solder inspection, document proofing, microscopy, medical and cosmetics applications. The short wavelength allows the XC-EU50/EU50CE models to capture clearly very fine detail and surface structures, which cannot be detected using visible or IR lighting, including very small scratches, dust or blemishes, as well as special fluorescent materials.

### Dimensions & rear panel

**XC-ES50/XC-ES50CE, XC-ES51/XC-ES51CE,**  
**XC-ES30/XC-ES30CE, XC-EI50/XC-EI50CE,**  
**XC-EI30/XC-EI30CE, XC-EU50/EU50CE**



**XC-ES50L/XC-ES50LCE**



### Accessories

#### Compact camera adaptor

**DC-700/700CE**



- Compact, lightweight (700 g)
- External sync IN/OUT
- Trigger input/WEN output
- New EIAJ standard 12-pin connector
- Dimensions: 110 (W) x 53 (H) x 160 (D) mm

#### 12-pin camera cable (CE standard)

**CCXC-12P02N (2 m)**  
**CCXC-12P05N (5 m)**  
**CCXC-12P10N (10 m)**  
**CCXC-12P25N (25 m)**



#### Tripod Adaptor

**VCT-333I**



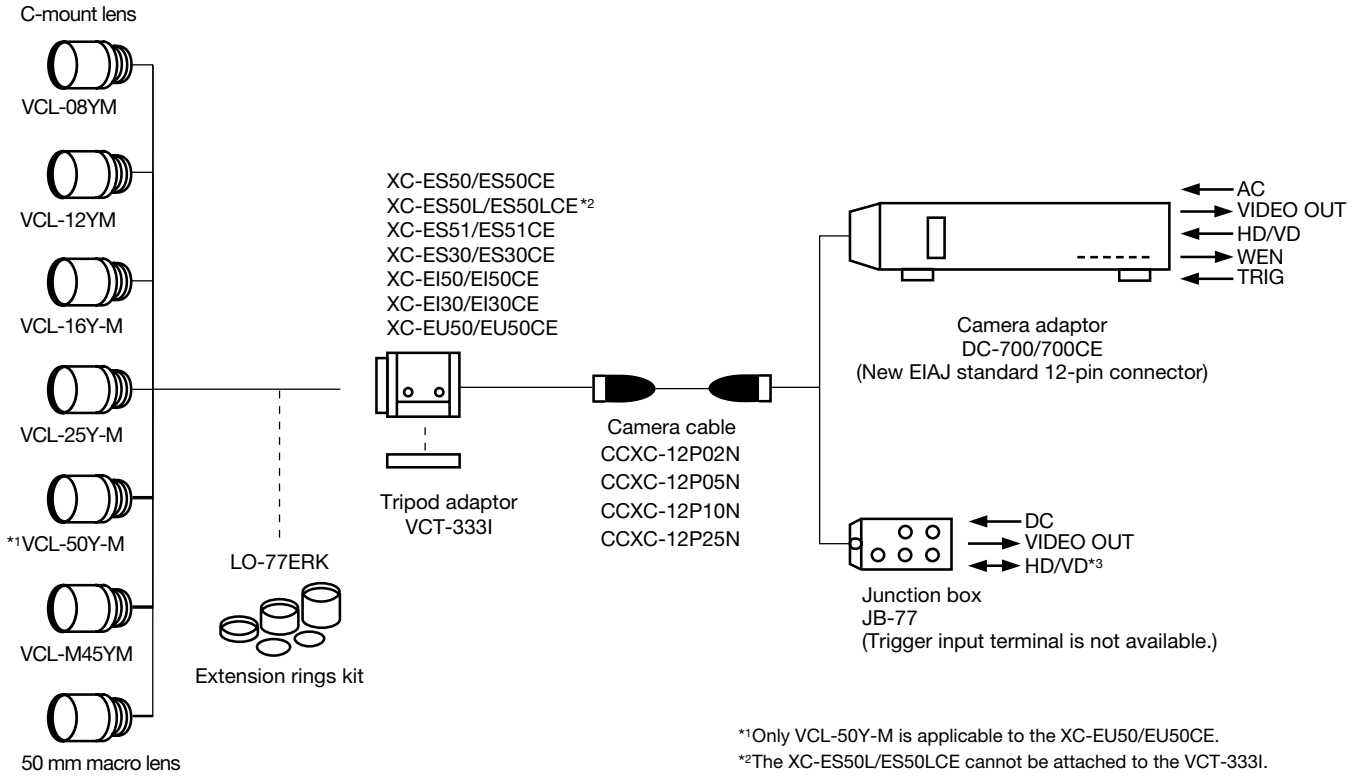
- ABS
- Approx. 6.1 g
- Dimensions: 18 (W) x 6 (H) x 2.9 (D) mm

#### Junction Box

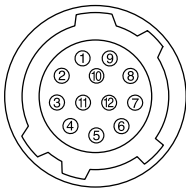
**JB-77**



Connection diagram



12 pin multi-connector



PIN No.	External sync (HD/VD)	Internal sync (HD/VD)
1	GND	GND
2	UNREG input	UNREG input
3	GND	GND
4	Video output	Video output
5	GND	GND
6	External HD input	Internal HD output
7	External VD input*	Internal VD output
8	GND	GND
9	-	-
10	WEN output**	WEN output**
11	TRIG input	TRIG input
12	GND	GND

\* RESET pulse is required when using restart, reset mode.

\*\* WEN output works only when in external trigger shutter mode.

Factory setting mode of rear panel

XC-ES50/XC-ES50CE, XC-ES51/XC-ES51CE, XC-ES30/XC-ES30CE, XC-EI50/XC-EI50CE, XC-EI30/XC-EI30CE, XC-EU50/XC-EU50CE, XC-ES50L/XC-ES50LCE



No.	Switch name	Factory-setting mode	
1	Shutter speed/Mode setting DIP switch	Dip switch 1-4: Shutter speed	OFF
		Dip switch 5: FRAME/FIELD	FRAME
		Dip switch 6-8: External trigger shutter mode, restart/reset mode	Normal
		Dip switch 9: Gamma ON/OFF	OFF
	Dip switch 0: GAIN	Manual	
2	HD/VD signal input/output switch	EXT	
3	Control volume for Manual GAIN	Twelve o'clock position	
4	75 Ω termination switch	ON	

Specifications

	XC-ES50	XC-ES50L	XC-ES51	XC-ES30	XC-EI50	XC-EI30	XC-EU50	
Image device	1/2 type IT CCD			1/3 type IT CCD	1/2 type IT CCD	1/3 type IT CCD	1/2 type IT CCD	
Effective picture elements	768 (H) x 494 (V)							
Signal system	EIA standard							
Horizontal frequency	15.734 kHz							
Vertical frequency	59.94 Hz							
Cell size (µm)	8.4 x 9.8		6.35 x 7.4	8.4 x 9.8	6.35 x 7.4	8.4 x 9.8		
Lens mount	C mount							
Flange back	17.526 mm							
Sync system	Internal/External (auto)							
External sync	HD/VD (2 to 5 Vp-p)							
External sync frequency	± 1 %							
Jitter	Less than ± 50 nsec							
Scanning system	2:1 Interlaced							
Video output	1.0 Vp-p, negative, 75 Ω unbalanced							
Horizontal resolution	570 TV lines							
Sensitivity (Gamma ON, MIN GAIN, No IR cut filter)	400 lx F5.6	400 lx F4	400 lx F8	400 lx F4	400 lx F11	400 lx F8	-	
Minimum illumination*	0.3 lx	3.0 lx	0.2 lx	0.3 lx	0.1 lx	0.2 lx	-	
S/N ratio	60 dB							
Gain	AGC/Manual selectable							
Gamma	ON/OFF selectable							
Normal shutter	1/100 to 1/10,000 s							
External trigger shutter**	1/4 to 1/10,000 s							
Power requirements	DC 12 V (+9 to +16 V)							
Power consumption	1.6 W			1.4 W	1.6 W	1.4 W	1.6 W	
Dimension (W) x (H) x (D)	29 x 29 x 32 mm (1 3/16 x 1 3/16 x 1 5/16 inches)	29 x 42.5 x 43.8 mm (1 3/16 x 1 11/16 x 1 3/4 inches)	29 x 29 x 32 mm (1 3/16 x 1 3/16 x 1 5/16 inches)					
Mass	50 g (2 oz)	110 g (4 oz)	50 g (2 oz)					
Operating temperature	-5 to +45 °C (23 to 104 °F)							
Operating humidity	20 to 80 %							
Storage temperature	-30 to +60 °C (-22 to +140 °F)							
Storage humidity	20 to 95 %							
Vibration resistance	10 G (20 to 200 Hz)							
Shock resistance	70 G							
MTBF	126,000 hrs.							
Regulatory compliance	UL1492, FCC Class B Digital Device, CE (EN61326/97 + A1/98), AS42511 + AS42522							
Supplied accessories	Lens mount cap (1), Operating instructions (1)							

\* (F1.4, AGC ON, without IR cut filter) \*\* Using Dip switch on the rear panel or Using trigger pulse width

	XC-ES50CE	XC-ES50LCE	XC-ES51CE	XC-ES30CE	XC-EI50CE	XC-EI30CE	XC-EU50CE	
Image device	1/2 type IT CCD			1/3 type IT CCD	1/2 type IT CCD	1/3 type IT CCD	1/2 type IT CCD	
Effective picture elements	752 (H) x 582 (V)							
Signal system	CCIR (standard)							
Horizontal frequency	15.625 kHz							
Vertical frequency	50 Hz							
Cell size (µm)	8.6 x 8.3		6.5 x 6.25	8.6 x 8.3	6.5 x 6.25	8.6 x 8.3		
Lens mount	C mount							
Flange back	17.526 mm							
Sync system	Internal/External (auto)							
External sync	system HD/VD (2 to 5 Vp-p)							
External sync frequency	frequency ± 1 %							
Jitter	Less than ± 50 nsec							
Scanning system	2:1 Interlaced							
Video output	1.0 Vp-p, negative, 75 Ω unbalanced							
Horizontal resolution	560 TV lines							
Sensitivity (Gamma ON, MIN GAIN, No IR cut filter)	400 lx F5.6	400 lx F4	400 lx F8	400 lx F4	400 lx F11	400 lx F8	-	
Minimum illumination*	0.3 lx	3.0 lx	0.2 lx	0.3 lx	0.1 lx	0.2 lx	-	
S/N ratio	60 dB							
Gain	AGC/Manual selectable							
Gamma	ON/OFF selectable							
Normal shutter	1/120 to 1/10,000 s							
External trigger shutter**	1/4 to 1/8,000 s							
Power requirements	DC 12 V (+9 to +16 V)							
Power consumption	1.6 W			1.4 W	1.6 W	1.4 W	1.6 W	
Dimension (W) x (H) x (D)	29 x 29 x 32 mm (1 3/16 x 1 3/16 x 1 5/16 inches)	29 x 42.5 x 43.8 mm (1 3/16 x 1 11/16 x 1 3/4 inches)	29 x 29 x 32 mm (1 3/16 x 1 3/16 x 1 5/16 inches)					
Mass	50 g (2 oz)	110 g (4 oz)	50 g (2 oz)					
Operating temperature	-5 to +45 °C (23 to 104 °F)							
Operating humidity	20 to 80 %							
Storage temperature	-30 to +60 °C (-22 to +140 °F)							
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Vibration resistance	10 G (20 to 200 Hz)							
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\* (F1.4, AGC ON, without IR cut filter) \*\* Using Dip switch on the rear panel or Using trigger pulse width

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