SONY

CCD B/W Video Camera Module

XC-ST30/CE
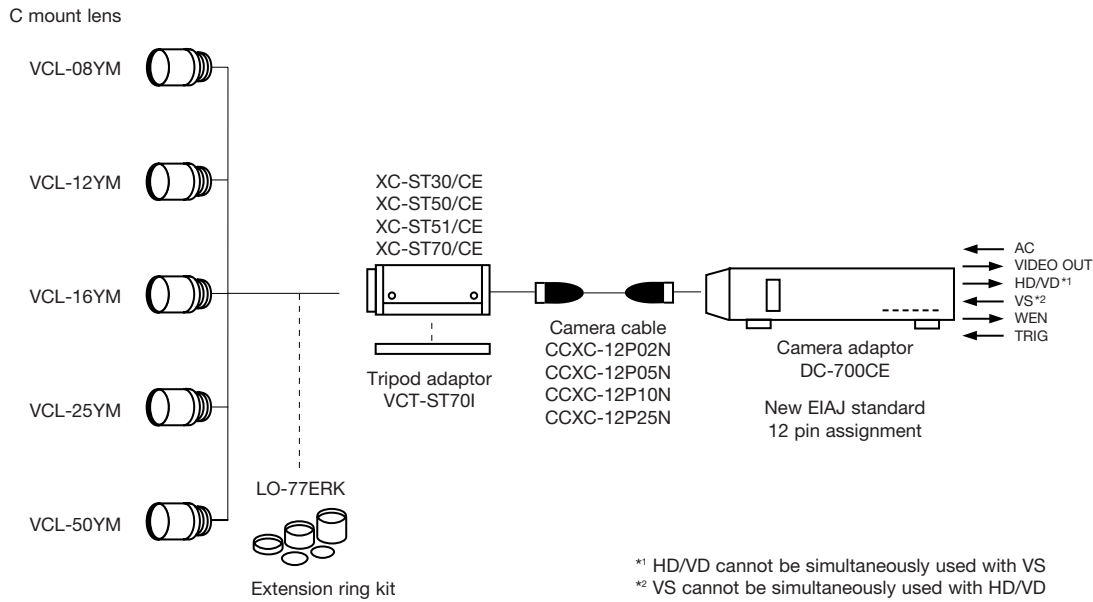### XC-ST50/CE
XC-ST51/CE
XC-ST70/CE

The XC-ST Series cameras incorporate the innovative CCD and signal processing technologies into a compact black and white camera module. A new external trigger design allows the electronic shutter speed to be freely specified by the width of an external trigger pulse or by a switch setting on the rear panel of the camera. These cameras are also user-friendly, with all switch settings located on the rear panel.

Moreover, the 1/3 type CCD, 1/2 type CCD and 2⁄3 type CCD models have the exact same dimensions, simplifying space requirements and making it easy to interchange them if necessary. These features, along with high picture quality and high shock and vibration tolerance make the XC-ST Series cameras ideal for demanding machine vision applications.
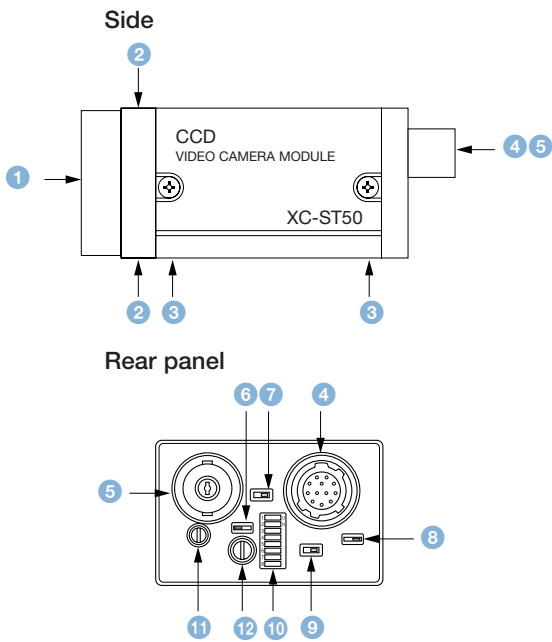
Features

- XC-ST30/CE: 1⁄3 type IT CCD
- XC-ST50/CE: 1⁄2 type IT CCD
- XC-ST51/CE: 1⁄2 type IT CCD
- XC-ST70/CE: 2⁄3 type IT CCD
- Small and lightweight: 44 (W) x 29 (H) x 57.5 (D) mm, 110 g (XC-ST70/CE is 105 g)
- High sensitivity: 0.3 lx (F1.4) (XC-ST51/CE has sensitivity of 0.2 lx at F1.4)
- High S/N ratio: 54 dB (XC-ST30CE), 58 dB (XC-ST50CE, XC-ST51CE and XC-ST70CE)
- Electronic shutter function (1/100 to 1/10,000 s)
- Flexible trigger shutter functions
    – simple trigger with internally generated HD/VD and Write Enable (WEN)
    – exposure control with switches or trigger pulse width
- Readout on command (with HD/VD input)
- 2:1 interlace
- Frame/field exposure
- Restart/Reset mode
- Synchronisation: internal/external (HD/VD, VS)
- High shock and vibration tolerance

Connections

C mount lens

VCL-08YM

VCL-12YM

XC-ST30/CE
XC-ST50/CE
XC-ST51/CE
XC-ST70/CE

VCL-16YM

→ AC
→ VIDEO OUT
→ HD/VD*1
→ VS*2
→ WEN
→ TRIG

VCL-25YM

Camera cable
CCXC-12P02N
CCXC-12P05N
CCXC-12P10N
CCXC-12P25N

Camera adaptor
DC-700CE

New EIAJ standard
12 pin assignment

Tripod adaptor
VCT-ST70I

LO-77ERK

VCL-50YM

Extension ring kit

*1 HD/VD cannot be simultaneously used with VS
*2 VS cannot be simultaneously used with HD/VD

Locations of Parts & Operations

Side

CCD
VIDEO CAMERA MODULE

XC-ST50

Rear panel

❶ Lens mount (C mount)
A commercial C mount lens as well as Sony standard lenses can be used.

❷ Camera fixing reference hole
High-precision screw hole machined on the lens mount surface.

❸ Screw hole for tripod adaptor installation (VCT-ST70I)

❹ 12 pin multi-connector
The 12 pin multi-connector is connected to a DC IN/SYNC (DC power/sync signal input)

❺ BNC connector
Video out

❻ Gamma correction
ON/OFF switchable

❼ Internal/External synchronisation switch
In the EXT position, if there is no external sync input, the internal sync is activated inside the camera. In this case, HD/VD signal is not output through the 12 pin multi-connector.
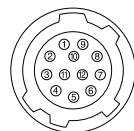
❽ Trigger polarity switch
The trigger polarity is selectable (neg/pos polarity)

❾ 75 Ω termination switch

❿ Dip switch
Dip switch 1 - 4: Shutter speed
Dip switch 5: FRAME/FIELD exposure
Dip switch 6 - 8: Normal shutter mode, External trigger shutter mode, Restart/Reset mode

⓫ Gain switch
A: Image output at a fixed level of image according to the brightness of the subject. (Variable range: 0 to 18 dB)
F: Fixed gain 0 dB
M: gain (manual)
Factory setting: the variable gain is adjusted to the fixed sensitivity for a standard subject. When using two or more XC-ST30/CE, XC-ST50/CE, XC-ST51/CE or XC-ST70/CE cameras, identical images of the same subject can be attained.

⓬ Gain control
The gain can be adjusted between 0 to 18 dB when the gain switch is set to "M".

12 pin multi-connector

Pin No.	Internal HD/VD sync	External HD/VD sync	External C. sync
1	GND	GND	GND
2	+12 V	+12 V	+12 V
3	GND	GND	GND
4	VIDEO output	VIDEO output	VIDEO output
5	GND	GND	GND
6	Internal HD output	External HD input	—
7	Internal VD output	*3 External VD input	VS input
8	GND	GND	GND
9	—	—	—
10	*4 WEN output	*4 WEN output	*4 WEN output
11	TRIG input	TRIG input	TRIG input
12	GND	GND	GND

*3 : In Restart/Reset mode VD input is necessary
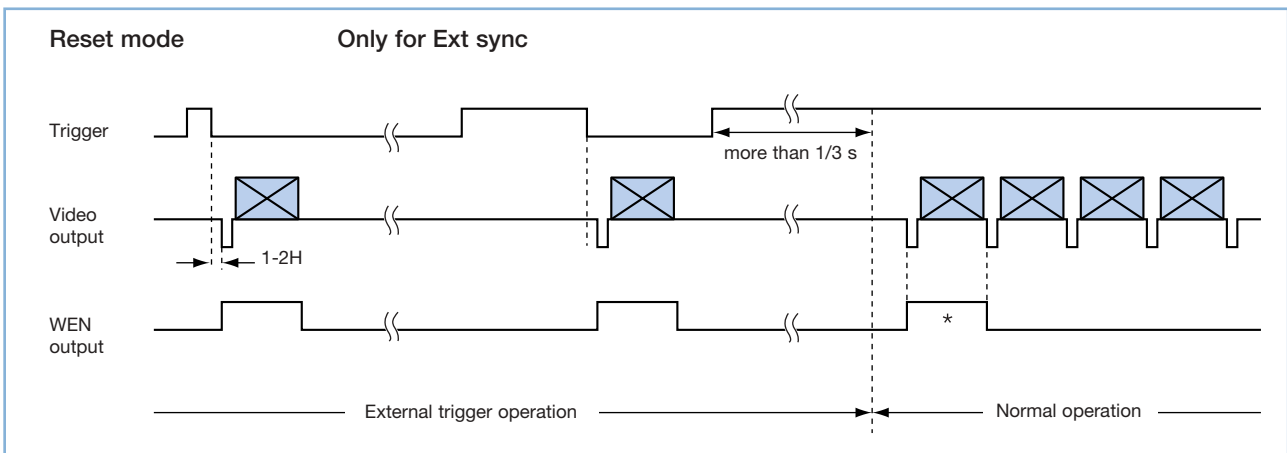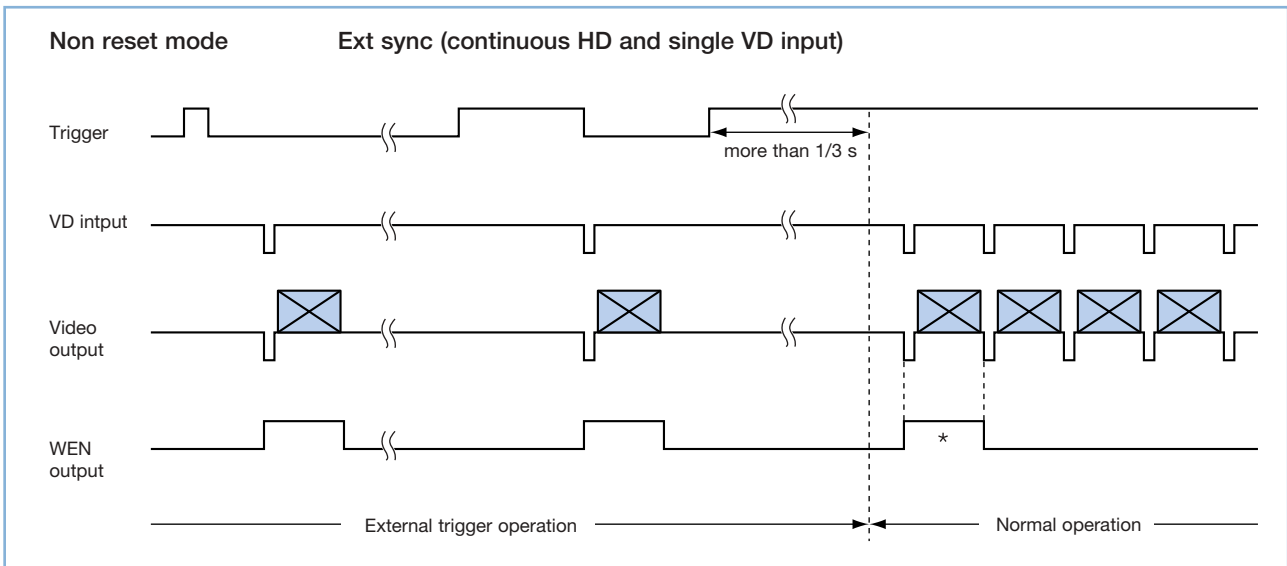*4 : WEN output is only effective in EXT trigger shutter mode

❹ 12 pin multi-connector

Rear panel factory settings

No.	Switch	Factory setting
❻	Gamma correction ON/OFF	OFF
❼	Internal/External sync	EXT
❽	Trigger polarity	+
❾	75 Ω termination	ON
❿	Dip switch	
	1 · 2 · 3 · 4: Shutter speed	OFF
	5: Field/Frame	OFF
	6 · 7 · 8: normal shutter/EXT trigger shutter/restart reset	OFF
⓫	GAIN	FIX

Trigger Shutter Modes

A new external trigger design allows the electronic shutter speed to be freely specified by the width of an external trigger pulse or by a switch setting on the rear panel of the camera.

Shutter speed setting based on the trigger width

Non reset mode **Ext sync (continuous HD/continuous VD input), or internal sync**

Trigger

more than 1/3 s

Video output

WEN output

*

External trigger operation ————————— Normal operation

Non reset mode **Ext sync (continuous HD and single VD input)**

Trigger

more than 1/3 s

VD intput

Video output

WEN output

*

External trigger operation ————————— Normal operation

Reset mode **Only for Ext sync**

Trigger

more than 1/3 s

Video output

1-2H

WEN output

*

External trigger operation ————————— Normal operation

* When switching from Ext. trigger to regular operation the WEN pulse is output

Shutter speed settings by dip switch control

Shutter speeds are set by dip switches 6, 7, 8, on the camera's rear panel. The width of the trigger pulse is irrelevant.

XC-ST Series

	XC-ST30	XC-ST50	XC-ST51	XC-ST70	XC-ST30CE	XC-ST50CE	XC-ST51CE	XC-ST70CE
Image device	1/3 type IT CCD	1/2 type IT CCD	1/2 type IT CCD	2/3 type IT CCD	1/3 type IT CCD	1/2 type IT CCD	1/2 type IT CCD	2/3 type IT CCD
Effective pictures elements	768 (H) x 494 (V)				752 (H) x 582 (V)			
Signal system	EIA standard				CCIR standard			
Horizontal frequency	15.734 kHz ±1%				15.625 kHz ±1%			
Vertical frequency	59.94 Hz				50 Hz			
Lens mount	C mount							
Flange back	17.526 mm							
Sync system	Internal / External (auto)							
External Sync system	HD / VD (2 ~ 5 Vp-p), VS							
External Sync frequency	Horizontal sync frequency ± 1%							
Jitter	less than ± 50 nsec							
Scanning system	525 lines, 60 fields/s, 2:1 Interlaced				625 lines, 50 fields/s, 2:1 Interlaced			
Video output	1.0 Vp-p, negative, 75 Ω unbalanced							
Horizontal resolution	570 TV lines				560 TV lines			
Sensitivity (γ compensation ON, 0 dB)	400 lx, F5.6	400 lx, F8	400 lx, F11	400 lx, F8	400 lx, F5.6	400 lx, F8	400 lx, F11	400 lx, F8
Minimum illumination (F1.4, AGC ON, without IR cut filter)	0.3 lx		0.2 lx	0.3 lx	0.3 lx		0.2 lx	0.3 lx
S/N ratio	56 dB	60 dB			54 dB	58 dB		
Gain	AGC (0 ~18 dB) / Manual (0 ~18 dB) / Fixed (0 dB) Selectable							
Gamma	ON / OFF							
Normal shutter	1/100 ~ 1/10,000 s				1/120 ~ 1/10,000 s			
External trigger shutter	1/4 ~ 1/10,000 s				1/4 ~ 1/8,000 s			
Power requirements	DC 12 V ±10%							
Power consumption	1.9 W	2.0 W		2.1 W	1.9 W	2.0 W		2.1 W
Dimensions	44 (W) x 29 (H) x 57.5 (D) mm							
Mass	110 g		105 g		110 g			105 g
Operation temp. / Humidity	-5°C ~ +45°C / 20 ~ 80%							
Storage temp. / Humidity	-30°C ~ +60°C / 20 ~ 95%							
Vibration	10 G (20 ~ 200 Hz)							
Shock resistance	70 G							
MTBF	70,600 hrs.							
Regulations	UL6500, FCC Class B, IC Class B, CE (EN61326/97 + A1/98), AS4251.1 + AS4252.2							
Supplied accessories	Lens mount cap (x 1), Operating instructions (x 1)							
Optional accessories	DC-700CE: Compact camera adaptor (CE standard): Compact, lightweight, Two video outputs, External sync IN/OUT, Trigger input/WEN output, New EIAJ standard 12 pin assignment, Dimensions: 110 (W) x 53 (H) x 160 (D) mm CCXC-12P02N (2 m), CCXC-12P05N (5 m), CCXC-12P10N (10 m), CCXC-12P25N (25 m): 12 pin camera cable (CE standard) VCT-ST70I: Tripod adaptor: Isolated type, Approx. 14 g, Dimensions: 40 (W) x 6 (H) x 59 (D) mm							

Dimensions

XC-ST30/CE
XC-ST50/CE
XC-ST51/CE
XC-ST70/CE

Unit: mm
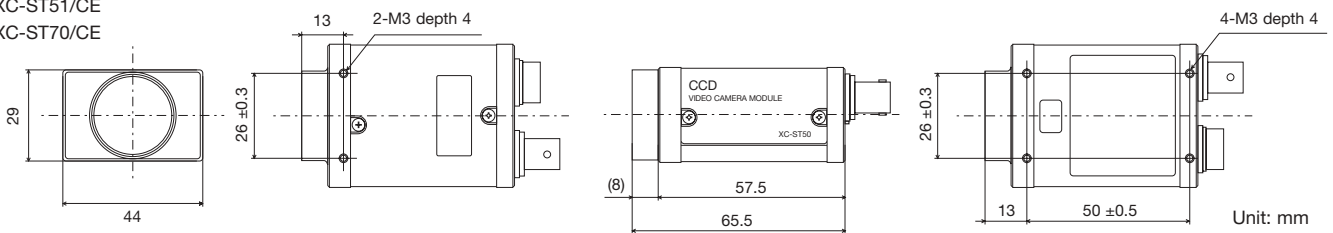
Sony Contacts

ISS for Central Zone +49 221 537 3668
(Austria, Eastern Europe, Germany, Netherlands, German-speaking Switzerland)

ISS for Nordic Zone +45 43 557 067
(Baltics, Denmark, Finland, Norway, Sweden)

ISS for Other Zone +44 1932 816 315
(UK, Ireland, Greece, Israel, South Africa)

ISS for South Zone +33 1 55 90 40 74
(Belgium, France, Portugal, Spain, French-speaking Switzerland)

ISS for Italy +39 (0) 6 334 372 27