Non-TV Format

TV Format

B/W Model

Color Model

Intelligent

Digital Interface
IEEE1394

Camera Link compatible

Accessories

Color PTZ Model

Color Camara Block

B/W VIDEO CAMERA MODULE

XC-EU50/EU50CE

| 1/2 Type CCD | C Lens Mount | VS Output | HD VD External Sync | Normal Shutter | Mode 1 (Non-Reset Mode) External Trigger Shutter | Mode 2 (Non-Reset Mode) External Trigger Shutter |

| Restart Reset | Long Exposure | Near-UV Sensitivity | Lead-Free Solder |

Connection Diagram P58

Outline

The XC-EU50/EU50CE is a monochrome video camera module with a 1/2 type CCD for industrial use. With its sensitivity around the near ultraviolet range (around 365 nm), utilized the feature of the shorter wavelength range characteristics and very detailed data can be detected. Small scratches, dust or blemishes hardly visible to the naked eye can be captured as a clear image by combining the camera with a light source that has a wavelength of about 360 nm.

This model inherited compact size, rear panel mode switches from the XC-E series and is ideal for use in industrial applications.

Features

■ XC-EU50/EU50CE: 1/2 type interline CCD
■ Near-UV sensitivity
■ High S/N ratio: 60 dB
■ Electronic shutter function (1/100 to 1/10,000 sec.)
■ External trigger shutter function (1/4 to 1/10,000 sec.)
■ 2:1 Interlaced/non-interlaced
■ Sync system: Internal/external (HD/VD)
■ Frame/field accumulation
■ Restart/reset function
■ High shock and vibration resistance

Accessories

■ Compact camera adaptor
　●DC-700/700CE
■ 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
■ C-mount LENS
　●VCL-50Y-M

Dimensions

Camera body of all XC-E models
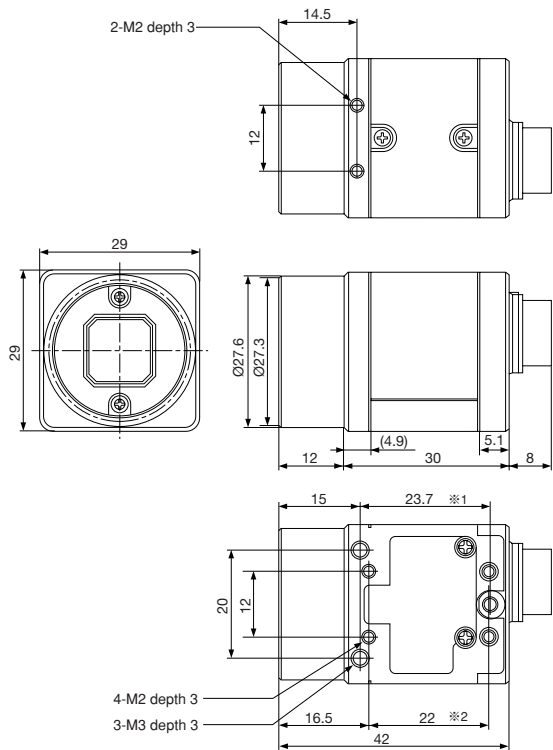
Unit: mm

*1: M3 screw size
*2: M2 screw size

Notice

From January 2005, the outside dimensions of XC-E series consoles will be changed to the same dimensions of XC-HR series consoles.
For the new outside dimensions, see page 48.
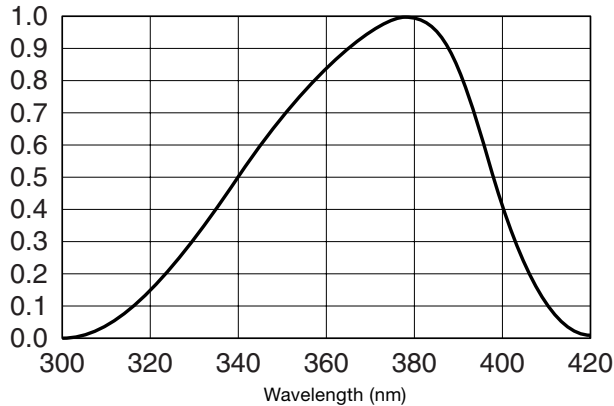The outside dimensions will be changed from the following serial numbers.
XC-EU50: 250001～
XC-EU50CE: 550001～

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Spectral Sensitivity Characteristics
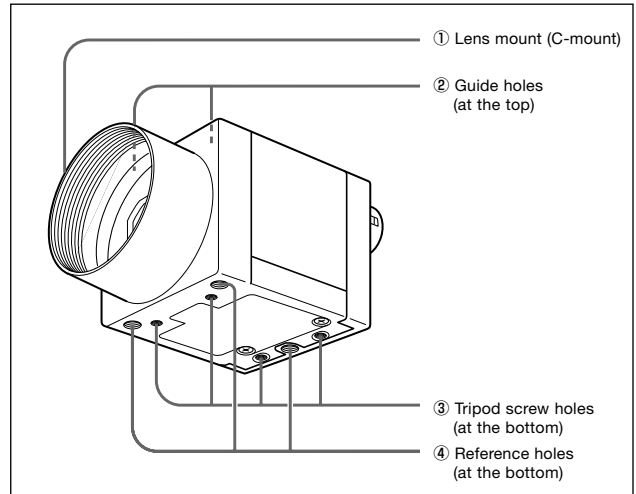
●XC-EU50/XC-EU50CE

(Typical Values)

Relative sensitivity

Wavelength (nm)
(Lens characteristics included, and light source characteristics excluded.)
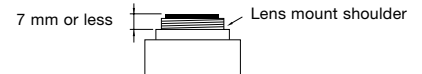
Location and Function of Parts and Controls

① Lens mount (C-mount)

② Guide holes (at the top)

③ Tripod screw holes (at the bottom)

④ Reference holes (at the bottom)

① **Lens mount (C-mount)**

Attach the VCL-50Y-M C-mount lens or other optical equipment.

Note

Be sure that the lens does not project more than 7mm from the lens mount.

7 mm or less ———— Lens mount shoulder

② **Guide holes (at the top)**

These screw holes help to lock the camera module.

③ **Tripod screw holes (at the bottom)**

These four screw holes on the bottom are for installing the camera module on a tripod. To install on a tripod, you will need to install the VCT-333I tripod adaptor using these holes on the bottom of the camera.
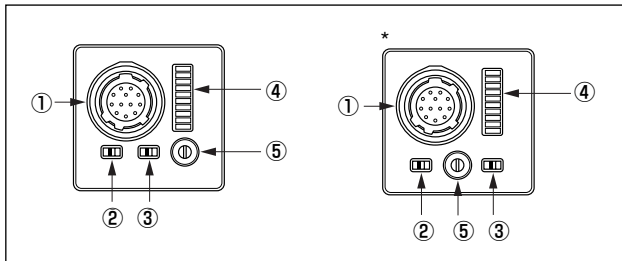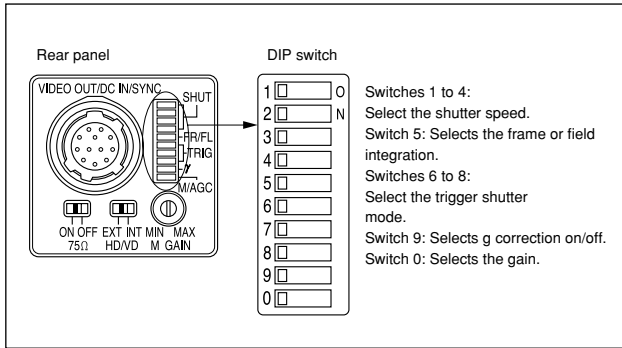
④ **Reference holes (at the bottom)**

These precision screw holes are for locking the camera module. Locking the camera module using these holes secures the optical axis alignment.

Specifications

	XC-EU50	XC-EU50CE
Image device	1/2 type IT CCD	
Signal system	EIA	CCIR
Effective picture elements	768 (H) x 494 (V)	752 (H) x 582 (V)
Effective lines	752 (H) x 485 (V)	736 (H) x 575 (V)
Horizontal frequency	15.734 kHz	15.625 kHz
Vertical frequency	59.94 Hz	50 Hz
Lens mount	C mount	
Sync system	Internal/External (auto)	
External sync system input/output*1	HD/VD (HD/VD level: 2 to 5 Vp-p)	
External sync frequency	±1 % (automatic switching)	
Jitter	less than ±20 nsec (external horizontal frequency)	
Scanning system	2:1 Interlaced	
Video output	1.0 Vp-p, negative, 75 Ω unbalanced	
Horizontal resolution	570 TV lines	560 TV lines
S/N ratio	60 dB	
Gain	AGC/Manual (adjustable on the rear panel)	
Gamma	ON/OFF (adjustable on the rear panel)	
Normal shutter	1/100 to 1/10,000 s	1/120 to 1/10,000 s
External trigger shutter	1/4 to 1/10,000 s	1/4 to 1/8,000 s
Power requirements	DC 12 V (+9 to16 V)	
Power consumtion	1.6 W	
Dimension (W) x (H) x (D)	29 x 29 x 30 mm	
Mass	50 g	
Operation temp. / humidity	-5 ℃ to +45 ℃ / 20 to 80 % (no condensation)	
Storage temp. / humidity	-30 ℃ to +60 ℃ / 20 to 95 % (no condensation)	
Vibration resistance	10 G (20 to 200 Hz in X,Y,Z directions)	
Shock resistance	70 G	
MTBF	126,469 hrs.	
Regulatory compliance	UL1492, FCC Class B Digital Device, CE (EN61326/97 + A1/98), Australia EMC (AS3548)	
Supplied accessories	Lens mount cap (1), Operating instructions (1)	

*1 Automatic switching in response to the presence of an input signal when the switch on the rear panel is set to EXT.

Rear Panel

Rear panel / DIP switch

VIDEO OUT/DC IN/SYNC
SHUT
FR/FL
TRIG
M/AGC
ON OFF EXT INT MIN MAX
75Ω HD/VD M GAIN

DIP switch: 1 (O) ... 0 (N)

Switches 1 to 4:
Select the shutter speed.
Switch 5: Selects the frame or field integration.
Switches 6 to 8:
Select the trigger shutter mode.
Switch 9: Selects g correction on/off.
Switch 0: Selects the gain.

* The rear panel is different for the serial numbers shown below.
XC-EU50   :200001～
XC-EU50CE :500001～

Note

Be sure to turn the power off before making switch settings. As the variable controller for manual adjustment is a small precise component, do not apply force more than required when adjusting. Doing so will break the component. The controller is not a 360-degree rotation type. Do not turn the controller beyond the stopper of the component. The range of rotation is about 260 degrees. For the adjustment of the variable controller, use a flathead screwdriver. The sizes of a recommended flathead screwdrivers are 1.9mm width, 0.5mm thickness and more than 0.45mm length.

① **12-pin multi-connector**
DC IN/HD/VD (DC power/sync signal input) VIDEO OUT terminal.

② **75Ω termination selector switch**

③ **HD/VD input-output selector switch**

④ **Shutter speed/mode setting DIP switch**

⑤ **Volume control switch**
This switch can be changed in the range of Switch 0 to 18 dB when the GAIN switch is set to "M".
*During factory setting, this switch is adjusted to the mechanical center.

Note

When setting DIP switch 5 to the frame integration, set the volume control switch 8 to the MAX side from the mechanical center (because of CCD characteristics).

Factory Mode Settings of Rear Panel

No.	Switch	Factory-setting mode
②	75 Ω termination selector switch	ON
③	HD/VD input-output selector switch	EXT
④	Shutter speed/mode setting DIP switch	
	Switches 1 to 4: Select the shutter speed.	OFF
	Switch 5: Selects the frame or field integration.	FRAME
	Switches 6 to 8: Select the trigger shutter mode.	Normal
	Switch 9: Selects correction on/off.	OFF
	Switch 0: Selects the gain.	Manual
⑤	Volume control switch	Mechanical center

Connector Pin Assignments

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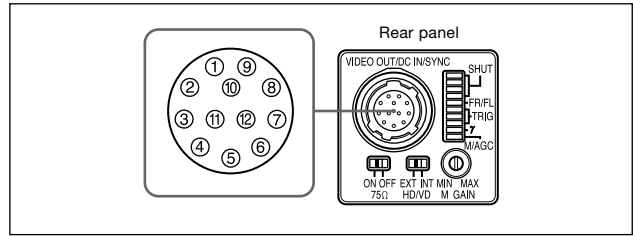
Pin No.	Camera sync output	External Sync (HD/VD)	Restart/Reset	External trigger shutter
1	Ground	Ground	Ground	Ground
2	+12V DC	+12V DC	+12V DC	+12V DC
3	Video output (Ground)	Video output (Ground)	Video output (Ground)	Video output (Ground)
4	Video output (Signal)	Video output (Signal)	Video output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

Normal Shutter

This mode provides continuous video output with the electronic shutter selected by switches to capture a high-speed moving object clearly.

Setting of the Normal Shutter

● Using the DIP switches on the rear panel

Shutter OFF	1/125	1/250	1/500	1/1000

1/2000	1/4000	1/10000 (EIA) 1/8000 (CCIR)	Flickerless* (EIA: 1/100 CCIR: 1/120)

(Unit: second)

* If you set the mode to flickerless, the positions of DIP switches 1 to 3 are optional.

Note

• The positions of DIP switches 6 and 7 are optional.

• The DIP switch 5 position is optional. (The field setting is recommended.) The field setting can obtain a sensitivity that is twice that of the frame setting.

External Trigger Shutter

By inputting an external trigger pulse, the camera is able to capture fast-moving objects clearly.
Set DIP switches 6, 7, and 8 on the rear panel to Mode 1 or Mode 2 (See the table below).
When you set the trigger pulse width to 1/3 of a second or more, the output signal changes to the normal VIDEO signal.
There are two modes for timing in which a video signal is obtained.

●Mode 1 (Non-reset mode)

In this mode, a video signal synchronized with a VD signal is output after a trigger pulse is input.
– A video signal is synchronized with the external VD signal when an external HD/VD signal is input.
– A video signal is synchronized with an internal VD signal when no external HD/VD signal is input.

●Mode 2 (Reset mode)

In this mode, an internal VD is reset, then an internal video signal is output after trigger pulse input after a certain period of time.

Setting of the External Trigger Shutter

You can set the shutter speed with the DIP switches or using the trigger pulse width.

●Using the DIP switches on the rear panel

Mode 1 (Non-reset mode): 1/100 (EIA)* 1/120 (CCIR)*, 1/125, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 (EIA) 1/8000 (CCIR)

Mode 2 (Reset mode): 1/100 (EIA)* 1/120 (CCIR)*, 1/125, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 (EIA) 1/8000 (CCIR)

(Unit: second)

* If 1/100 (EIA) or 1/120 (CCIR) has been set, the positions of DIP switches 1 to 3 are optional.
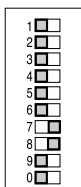
Note
> The positions of DIP switches 5, 9 and 0 are optional.

●Setting the external shutter speed with the trigger pulse width
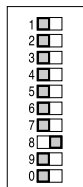
Set all DIP switches (1 to 4 on the rear panel) to 0.
You can obtain an arbitrary shutter speed by setting the trigger pulse width to the range of 2 μsec to 250 msec.

Mode 1 (Non-reset mode) Mode 2 (Reset mode)

Exposure time = Trigger pulse width + 97 μsec (EIA)
Trigger pulse width + 120 μsec (CCIR)

Note
> • The DIP switch 5 position is optional. (The field setting is recommended.) The field setting can obtain a sensitivity that is twice that of the frame setting.
>
> • If you input a new trigger pulse before the video signal output for the previous trigger pulse is output completely, an incorrect video signal will be output.

●Specifications of the Trigger Pulse

4 to 5.0 V
0 to 1.0 V
T: 2 μsec to 1/4 sec
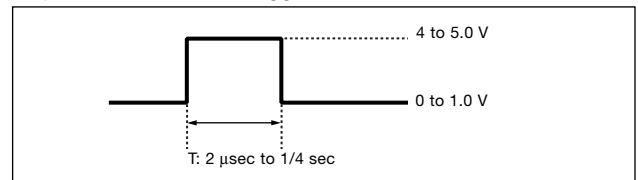
T: If you set the trigger pulse with the DIP switches, use the 100 μs to 1/4 sec pulse width.
• Input impedance; 10 kΩ or more.
• The voltage and pulse width used are measured at pin 11 of a 12-pin multi-connector on the rear panel.

Restart/Reset

To set Restart/Reset mode

The information on one screen can be extracted at any time by externally inputting a restart/reset signal (HD/VD). To enter this mode, set DIP switches 6, 7, and 8 on the rear panel of the camera as shown in the figure below. The setting is especially effective for the operation explained below.
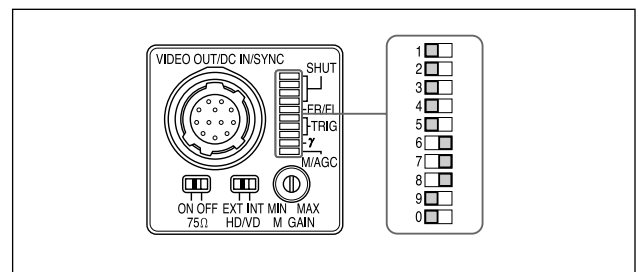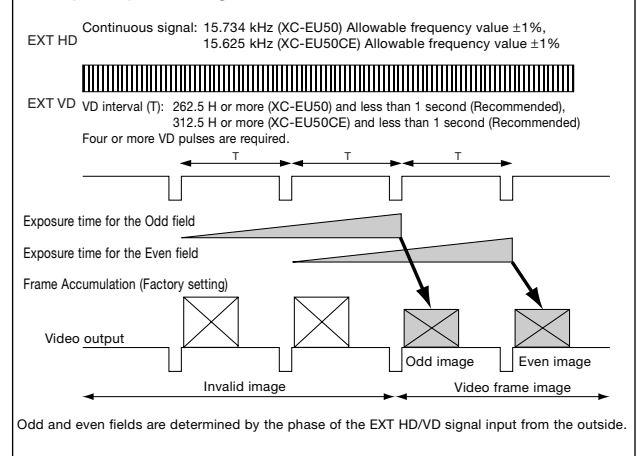

Long Exposure

The Restart/Reset function extends the CCD accumulation time, resulting in a highly sensitive image. This function is effective when you cannot gain satisfactory sensitivity under normal operating conditions, or when you want to observe a moving object. Extend the VD interval (T) period between external VD pulses.

Note
> Some white spots may appear after a long exposure.

Sample input timing chart 1

EXT HD   Continuous signal: 15.734 kHz (XC-EU50) Allowable frequency value ±1%, 15.625 kHz (XC-EU50CE) Allowable frequency value ±1%

EXT VD   VD interval (T): 262.5 H or more (XC-EU50) and less than 1 second (Recommended), 312.5 H or more (XC-EU50CE) and less than 1 second (Recommended) Four or more VD pulses are required.

Exposure time for the Odd field
Exposure time for the Even field
Frame Accumulation (Factory setting)
Video output
Odd image   Even image
Invalid image   Video frame image

Odd and even fields are determined by the phase of the EXT HD/VD signal input from the outside.

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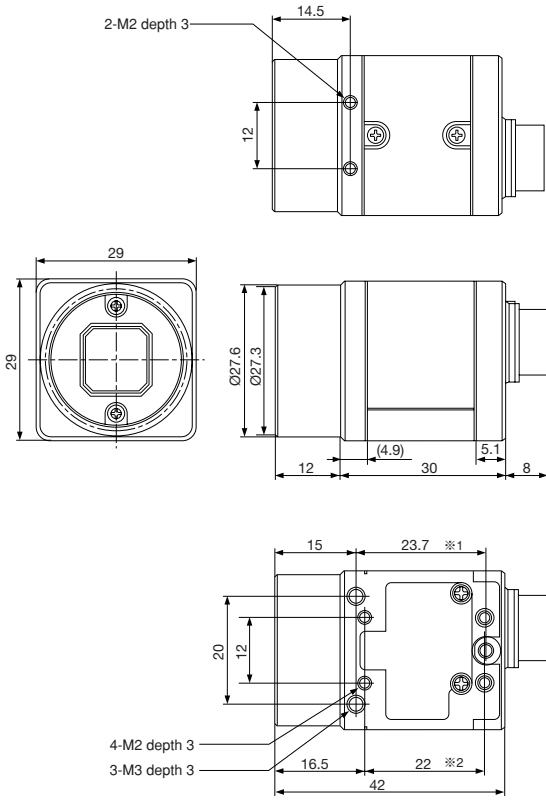IEEE1394

Camera Link compatible

Accessories

Color PTZ Model

Color Camara Block

Information of CX-E Series Console Modification

From January 2005, the outside dimensions of XC-E series consoles will be changed to the same dimensions of XC-HR series consoles.
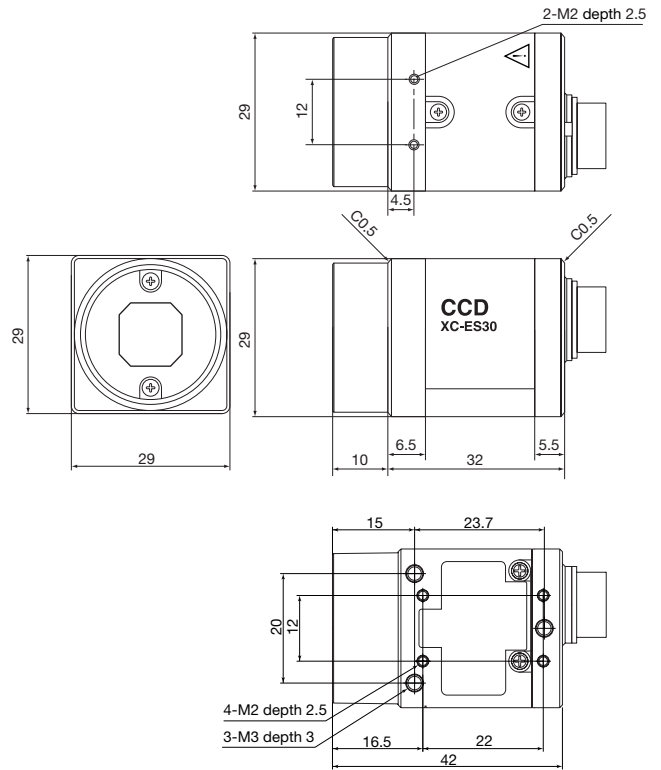
New Dimensions

Unit: mm

*1: M3 screw size
*2: M2 screw size

Old Dimensions

Unit: mm

The outside dimensions will be changed from the following serial number.

XC-ES50/ES30	: 250001~
XC-ES50CE/ES30CE	: 550001~
XC-ES51	: 150001~
XC-ES51CE	: 450001~
XC-EI50/EI30	: 250001~
XC-EI50CE/EI30CE	: 550001~
XC-EU50	: 250001~
XC-EU50CE	: 550001~

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