SONY

A-EV6-100-**11**(1)

CCD Black-and-White Video Camera Module

Technical Manual

XC-ST70/70CE

Table of Contents

Overview

XC-ST70/70CE, in succession to the XC-77/77CE that has become an enduring bestseller, is a small and lighter black-and-white video camera module equipped with the latest technology and the new-generation 2/3 inch CCD with a new concept. The operability has improved compared to existing products with the addition of the rear panel switches that can change each mode setting. Equipped with the external trigger shutter that captures fast-moving objects clearly by external signals, the camera enables you to obtain a freeze picture at any time. Following the needs of the 2/3 inch CCD that still remains a favorite in the image processing field, the XC-ST70/70CE meets the needs of high-level image inspection through high-definition images.
In addition, resistance against vibration is further improved compared to existing products, and the system is excellent in embedding images into machine vision devices.

Features

Equipped with a 2/3 inch IT CCD

Equipped with an external trigger shutter (XC-ST70: 1/4 to 1/10,000 s, XC-ST70CE: 1/4 to 1/8,000 s)

You can obtain a freeze picture by inputting an external trigger. This function is useful for shooting a fast-moving object at a precise moment.

The Restart/Reset function

By externally inputting the signals of continuous HD and VD (2VD) or higher, you can obtain a picture at any time and control the CCD accumulation.
This function is effective for long exposures.

Synchronization system: Internal/External HD/VD, VS (VS is available only when externally synchronized.)

By externally inputting an HD/VD signal, the camera module is automatically synchronized with the external sync signals (factory setting). This function is useful to effectively control multiple cameras from external systems.

Mode settings on the rear panel

By changing the DIP and rotary switches, you can change the setting of each mode. All switches are located on the rear panel, so you can easily change the setting after importing into machine vision devices.

Reduction in size and weight

C-mount

Internal structure of vibration resistance

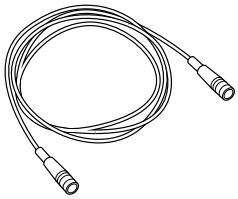
Compatibility

This product is highly-compatible with the XC-ST50 (equipped with the 1/2 inch CCD) and the XC-ST30 (equipped with the 1/3 inch CCD) since their sizes, functions, and operations are the same.

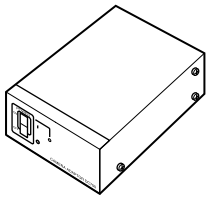
System Components

The XC-ST70/70CE Video Camera Module system is comprised of the following components.

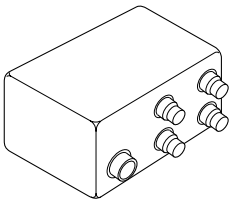
Video camera module
XC-ST70/70CE



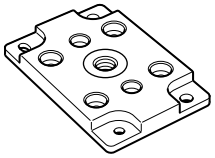
Camera cables
CCXC-12P02N (2 m)
CCXC-12P05N (5 m)
CCXC-12P10N (10 m)
CCXC-12P25N (25 m)



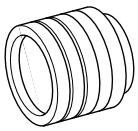
Camera adaptor
DC-700/700CE



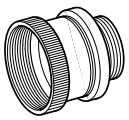
Junction box
JB-77



Tripod adaptor
VCT-ST70I (Insulated type)

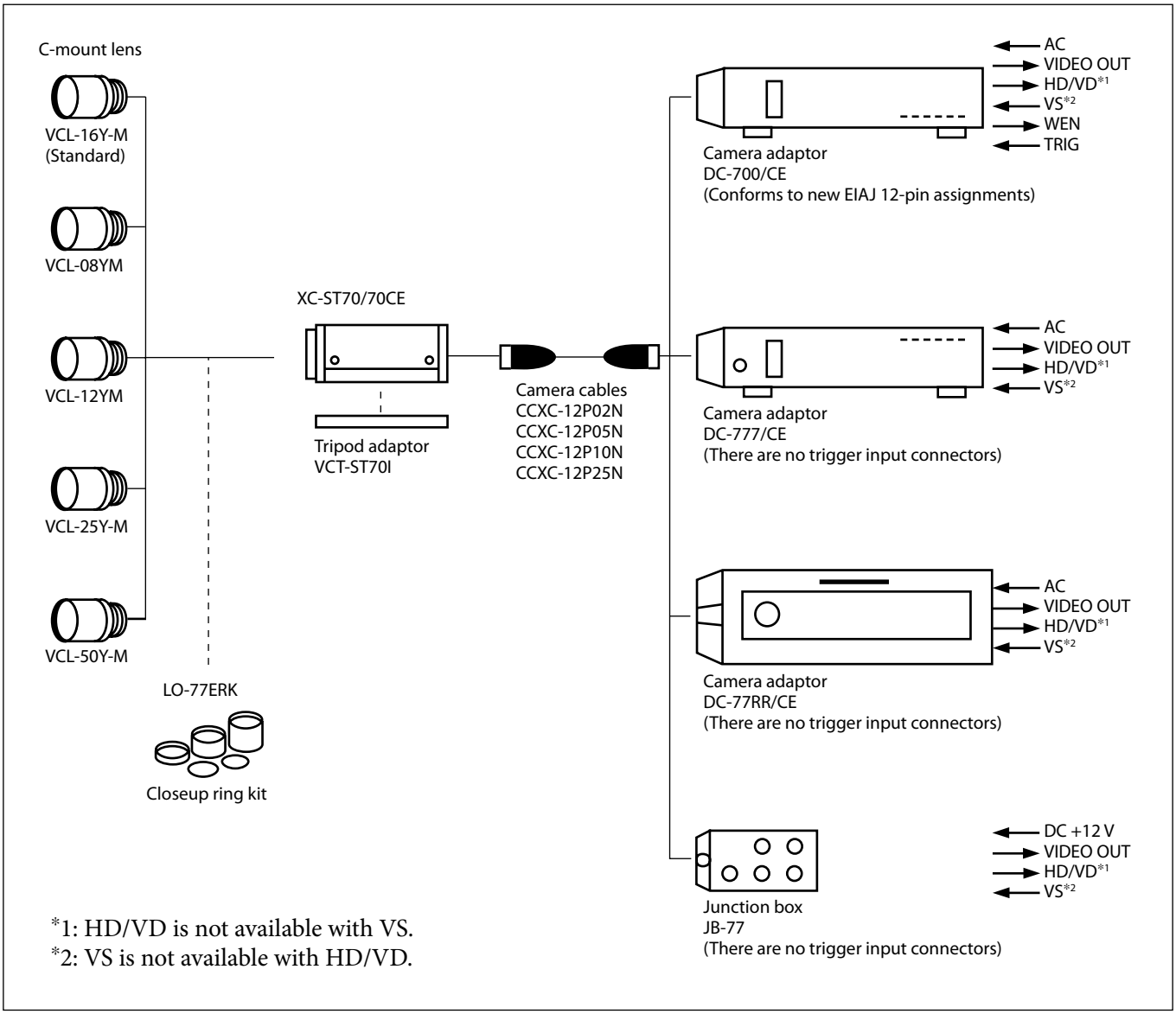


C-mount lens
VCL-50Y-M
VCL-25Y-M
VCL-16Y-M (Standard)
VCL-12YM
VCL-08YM



Closeup ring kit
LO-77ERK

Connection Diagram



Note

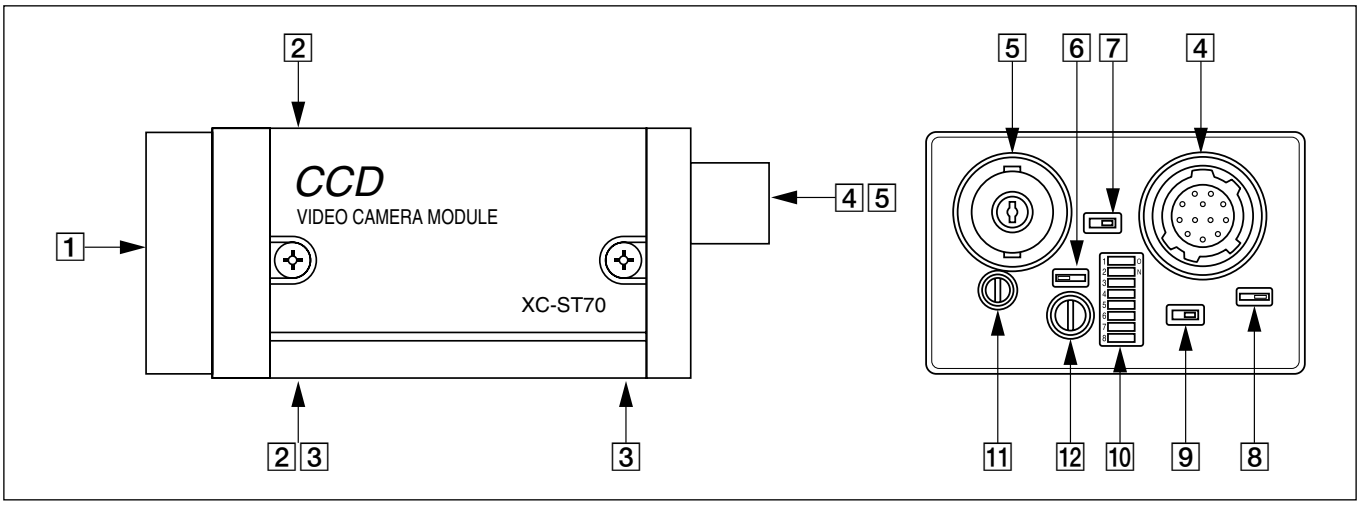
For DC-777/CE, DC-77RR/CE, and JB-77, some functions of the XC-ST70/70CE are not available. See the following table.

XC-ST70/70CE	DC-777/CE	DC-77RR/CE	JB-77
Normal	○	○	○
Normal shutter	○	○	○
Restart/Reset (R. R)	○	○	○
Restart/Reset (R. R) + shutter	○	○	○
External trigger shutter	×	×	×

○: Available
×: Not available

Location and Function of Parts and Controls

XC-ST70/70CE

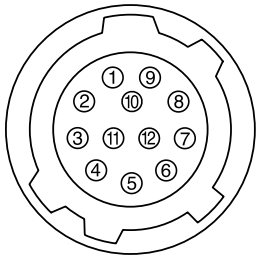


1 Lens mount face
Usage of the Sony standard lens and other commercial C-mount lens are available.

2 Reference holes
These precision screw holes are on the lens mount plane.

3 Tripod adaptor screw holes (VCT-ST70I)

4 12-pin multi-connector
DC IN/SYNC (DC power/sync input signal)



Pin No.	External HD/VD synchronization	Internal HD/VD synchronization	External VS synchronization
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	External HD input	Internal HD output	—
7	*1 External VD input	Internal VD output	VS
8	GND	GND	GND
9	—	—	—
10	*2 WEN output	*2 WEN output	*2 WEN output
11	Trigger input	Trigger input	Trigger input
12	GND	GND	GND

*1: Input VD signal when using the restart or reset function.
*2: WEN output is only available during the external trigger shutter mode.

5 BNC connector
Video output

6 Gamma correction ON/OFF switch

7 Internal/External synchronization switch
When the external synchronization is not input at the EXT position, the camera module operates in internal synchronization mode. In this case, the 12-pin multi-connector will not output an HD/VD signal.

8 Trigger polarity switch
This switch selects the polarity of the trigger. (Negative/Positive)

9 75Ω termination switch

10 DIP change switches
Switch 1, 2, 3, 4: Change Shutter speed
Switch 5: Frame/Field
Switch 6, 7, 8: Normal shutter/External trigger shutter/ Restart or Reset

11 Gain switch
A: Adjusts the video output at a certain level according to the brightness of objects. (Available range: 0 to 18 dB)
F: Fixed gain 0 dB
M: Changeable gain (Manual)
M (factory setting):
According to the sensitivity of each CCD, the volume is adjusted (to our company's standard value) so that all XC-ST70/70CEs are equally sensitive.

12 Volume control switch
When the gain switch is set to "M," the value can be changed from 0 to 18 dB. In the factory setting, the value is adjusted to a certain sensitivity level.

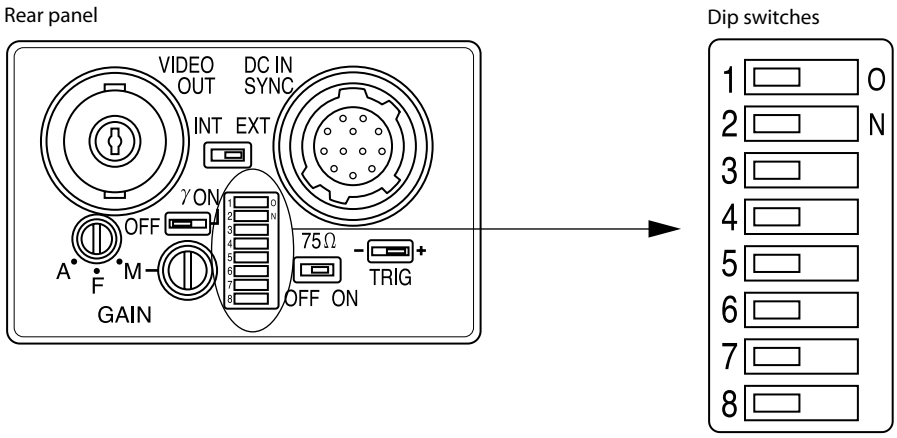
●Factory mode settings of rear panel

Number	Switches	Factory modes
6	Gamma correction ON/OFF switch	OFF
7	Internal/External synchronization switch	EXT
8	Trigger polarity switch	+
9	75Ω termination switch	ON
10	DIP change switches	
	1, 2, 3, 4: Shutter speed	OFF (left side)
	5: Frame/Field	
	6, 7, 8: Normal shutter/External trigger shutter/Restart or Reset	
11	Gain switch	FIX

About the Electronic Shutter

There are two shutter types: normal shutter and external trigger shutter.
Select them with the DIP switches on the rear panel.

Dip switches on the rear panel



Switch 1, 2, 3, 4: Change Shutter speed
Switch 5: Frame/Field
Switch 6, 7, 8: Normal shutter/External trigger shutter/Restart or Reset

Normal shutter

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

Normal shutter speed settings

Switches	Shutter Off	1/125	1/250	1/500	1/1000	1/2000	1/4000	1/10000	*Flickerless
1	0	1	0	1	0	1	0	1	—
2	0	0	1	1	0	0	1	1	—
3	0	0	0	0	1	1	1	1	—
4	0	0	0	0	0	0	0	0	1
5	Frame: 0/Field: 1								
6	—	—	—	—	—	—	—	—	—
7	—	—	—	—	—	—	—	—	—
8	0	0	0	0	0	0	0	0	0

* In the flickerless mode, the speeds are set to 1/100 seconds for XC-ST70 (EIA) and 1/120 seconds for XC-ST70CE (CCIR) respectively.

1 : ON
0 : OFF
—: Arbitrary

Note

The field setting is recommended for DIP switch 5. (A sensitivity twice as high as that of the frame setting can be gained.)

External trigger shutter

Inputting an external trigger pulse enables the camera to capture fast-moving objects clearly with precise positioning.
Set DIP switches 6, 7, and 8 on the rear panel to Mode 1 or Mode 2. (See the following table.)
When you set the trigger pulse width to one third of a second or more, the output signal changes to the normal VIDEO signal.

There are two modes for the timing in which video signals are 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.
- The video signal is synchronized with the external VD signal when an external HD/VD signal is input.
- The video signal is synchronized with an internal VD signal when no external HD/VD signal is input.

•Mode 2 (Reset mode)

In this mode, a video signal is output for a certain period of time after trigger pulse input.

* For each timing chart, see pages 18 to 25.

External trigger shutter speed settings

There are two ways to set the shutter speed.

Using the DIP switches on the rear panel

Mode 1 (Non-reset mode)

Switches	*1/100	1/125	1/250	1/500	1/1000	1/2000	1/4000	**1/10000
1	—	1	0	1	0	1	0	1
2	—	0	1	1	0	0	1	1
3	—	0	0	0	1	1	1	1
4	1	0	0	0	0	0	0	0
5	Frame: 0/Field: 1							
6	0	0	0	0	0	0	0	0
7	1	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1	1

Mode 2 (Reset mode)

Switches	*1/100	1/125	1/250	1/500	1/1000	1/2000	1/4000	**1/10000
1	—	1	0	1	0	1	0	1
2	—	0	1	1	0	0	1	1
3	—	0	0	0	1	1	1	1
4	1	0	0	0	0	0	0	0
5	Frame: 0/Field: 1							
6	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0
8	1	1	1	1	1	1	1	1

* Set to 1/100 seconds for XC-ST70 (EIA), and 1/120 seconds for XC-ST70CE (CCIR).

** Set to 1/10000 seconds for XC-ST70 (EIA), and 1/8000 seconds for XC-ST70CE (CCIR).

1 : ON
0 : OFF
—: Arbitrary

Using 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 within the range 2 µsec to 250 msec.

Switches	Mode 1 (Non-reset mode)	Mode 2 (Reset mode)
1	0	0
2	0	0
3	0	0
4	0	0
5	Frame: 0/Field: 1	
6	0	0
7	1	0
8	1	1

1 : ON
0 : OFF

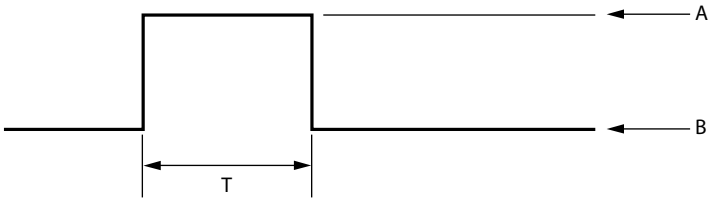
Exposure time = Trigger pulse width + 97 µ sec (EIA)
120 µ sec (CCIR)

Note

1. The field setting is recommended for the DIP switches. (A sensitivity twice as high as that of the frame setting can be gained.)
2. Input a new trigger pulse after the video signal output for the previous trigger pulse is output completely.

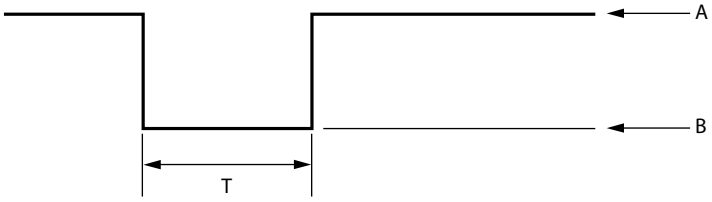
Trigger pulse specifications

When using on the [+] side of the trigger polarity switch on the rear panel



A: 2 to 5.0 V
B: 0 to 0.6 V
T: 2 µsec to 1/4 sec

When using on the [–] side of the trigger polarity switch on the rear panel



A: 4.0 to 5.0 V
B: 0 to 2.0 V
T: 2 µsec to 1/4 sec

* Input impedance: 10 kΩ or more.
* The voltage and pulse width used are as measured at pin 11 of the 12-pin multi-connector on the rear panel.

Restart/Reset (R.R)

The information on one screen can be extracted at any time by externally inputting restart/reset signals (HD/VD). To enter this mode, set the DIP switches 6, 7, and 8 on the rear panel of the camera as shown in the table below. It is especially effective in the following cases.

Switches	Restart/Reset (R.R)
1	0
2	0
3	0
4	0
5	0
6	1
7	1
8	1

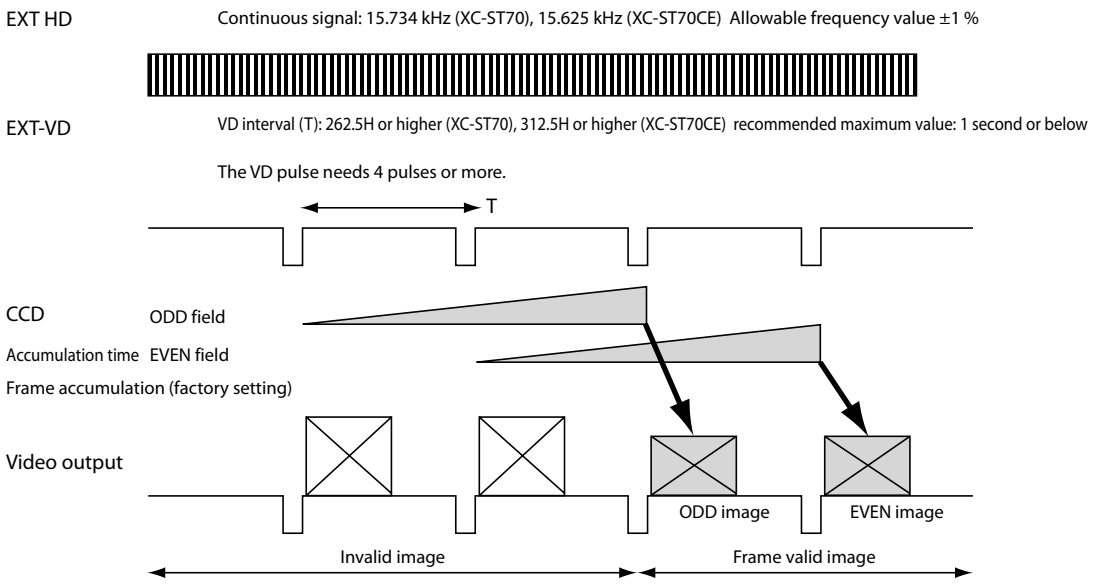
1 : ON
0 : OFF

Long exposure

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

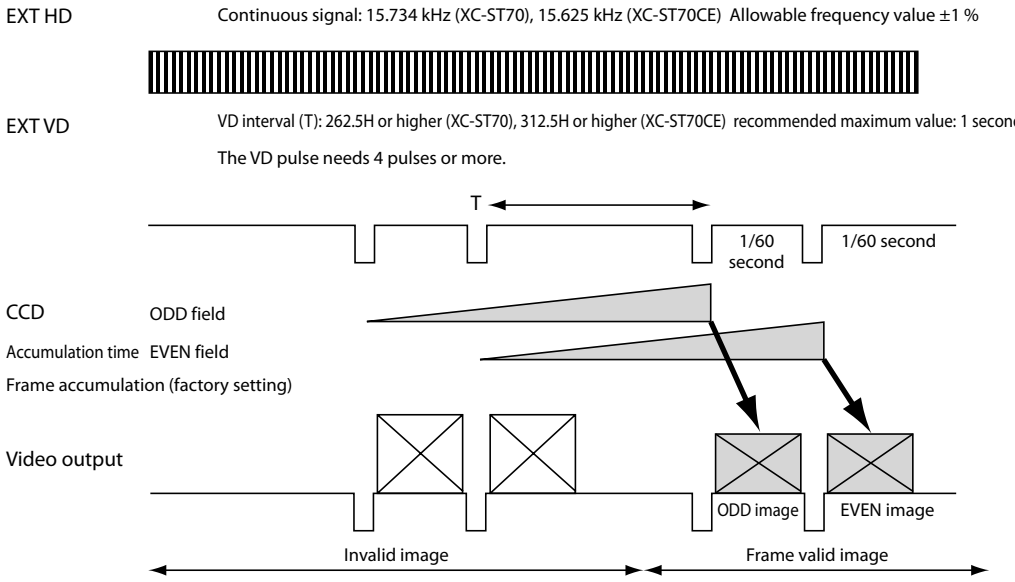
Timing and conditions:

Long exposure Example 1



ODD/EVEN is determined by the external HD/VD phase.

Long exposure Example 2



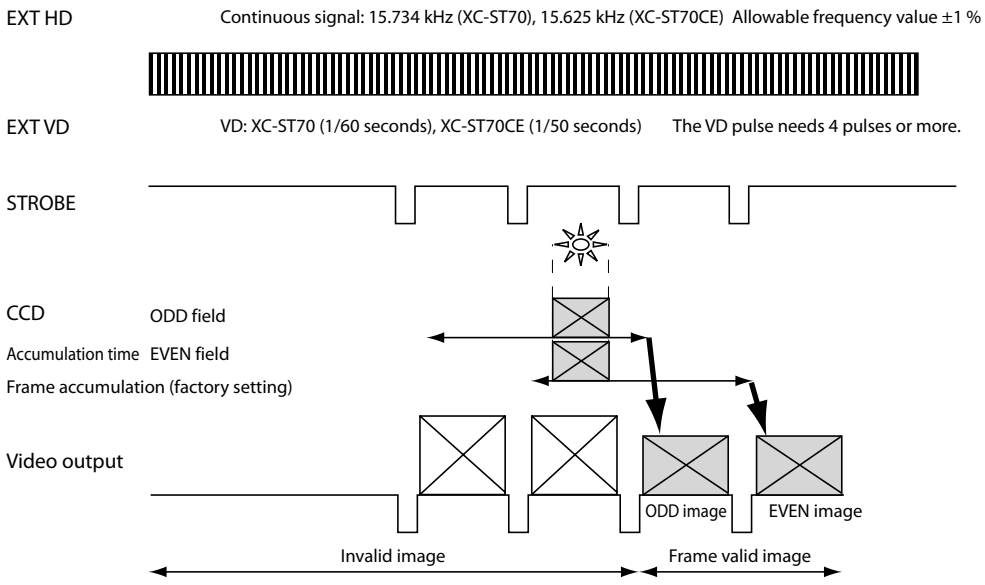
ODD/EVEN is determined by the external HD/VD phase.
When the camera is set to the field accumulation, the image is output by the accumulated time of the CCD field.

Frame image output using strobe devices simultaneously

In the factory mode setting, this camera is set to frame accumulation, but images obtained when using the normal continuous shutter or trigger shutter are field images (longitudinal resolution: 243 lines). By using strobe devices and the Restart/Reset mode simultaneously, bright frame images can be obtained according to arbitrary strobe lights (longitudinal resolution: 485 lines).

Timing and conditions:

<Timing Chart by Restart/Reset>

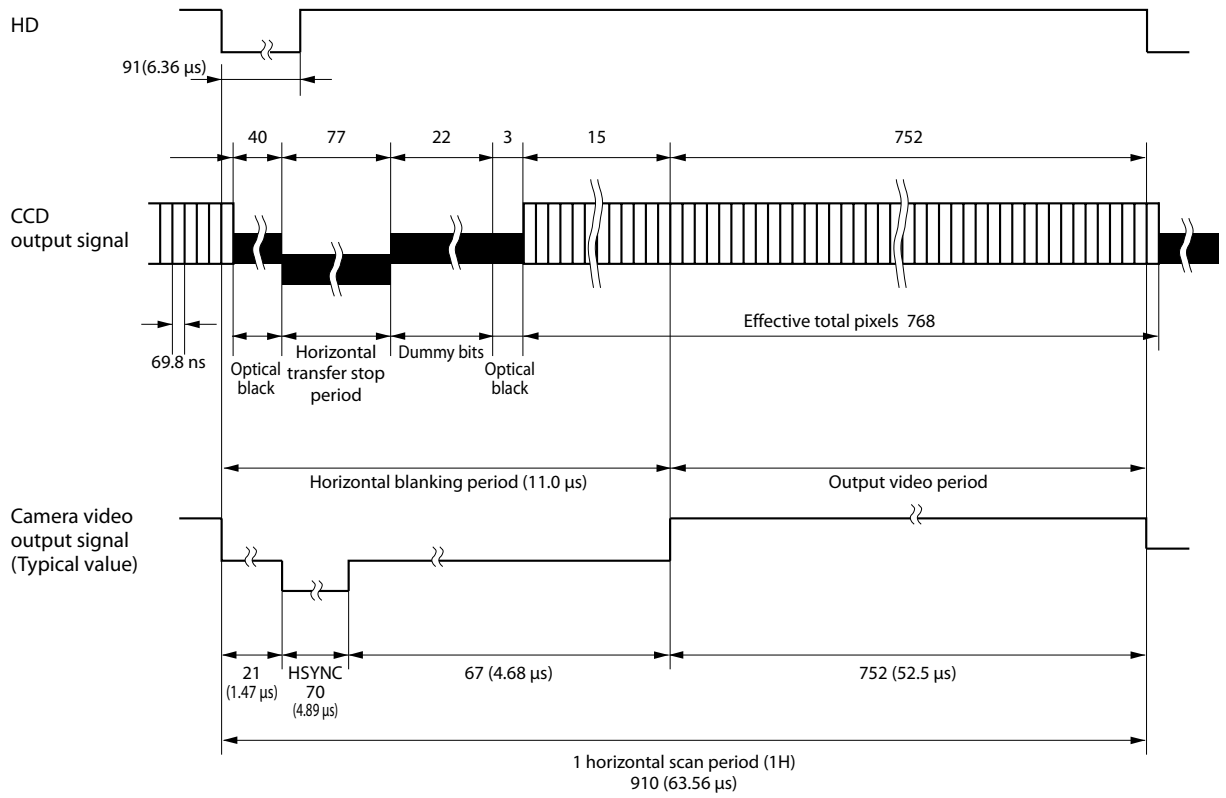


ODD/EVEN is determined by the external HD/VD phase.
Do not emit lights in the following range to synchronize strobe lights with the desired image.
Forbidden range: XC-ST70: Within 10H after running the VD signal
XC-ST70CE: Within 16H after running the VD signal

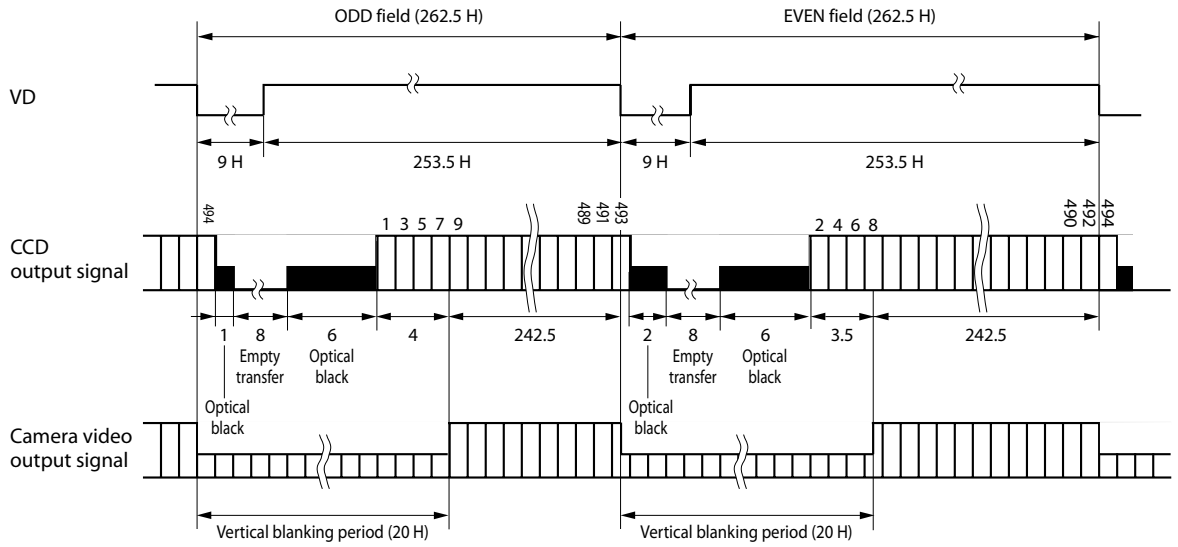
Timing Chart

Output Waveform Timing Chart

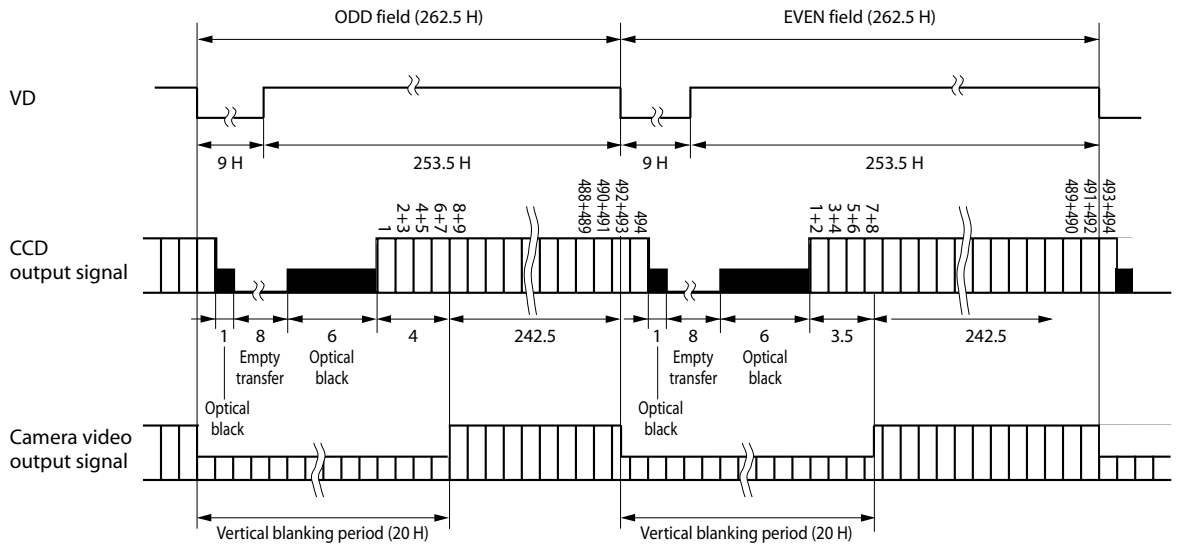
Horizontal output waveform timing chart



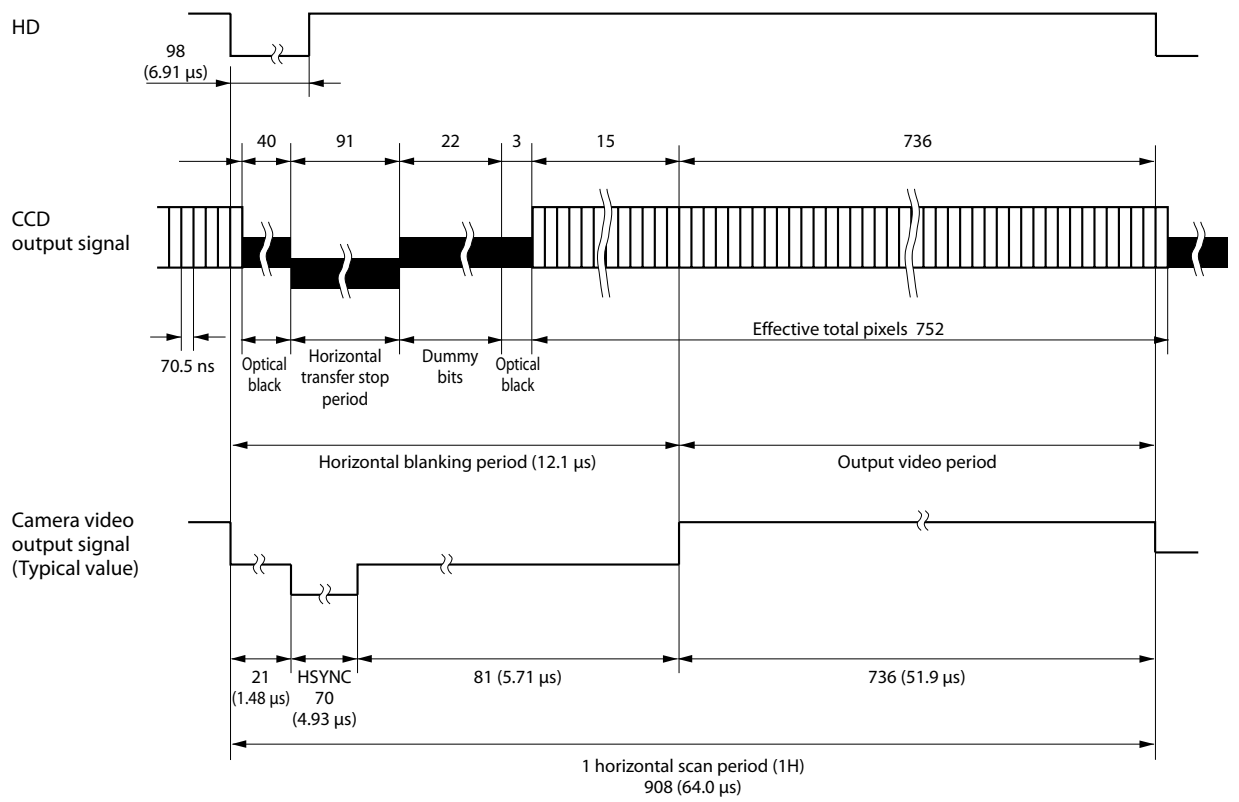
Vertical output waveform timing chart (2:1 Interlace/Frame accumulation)



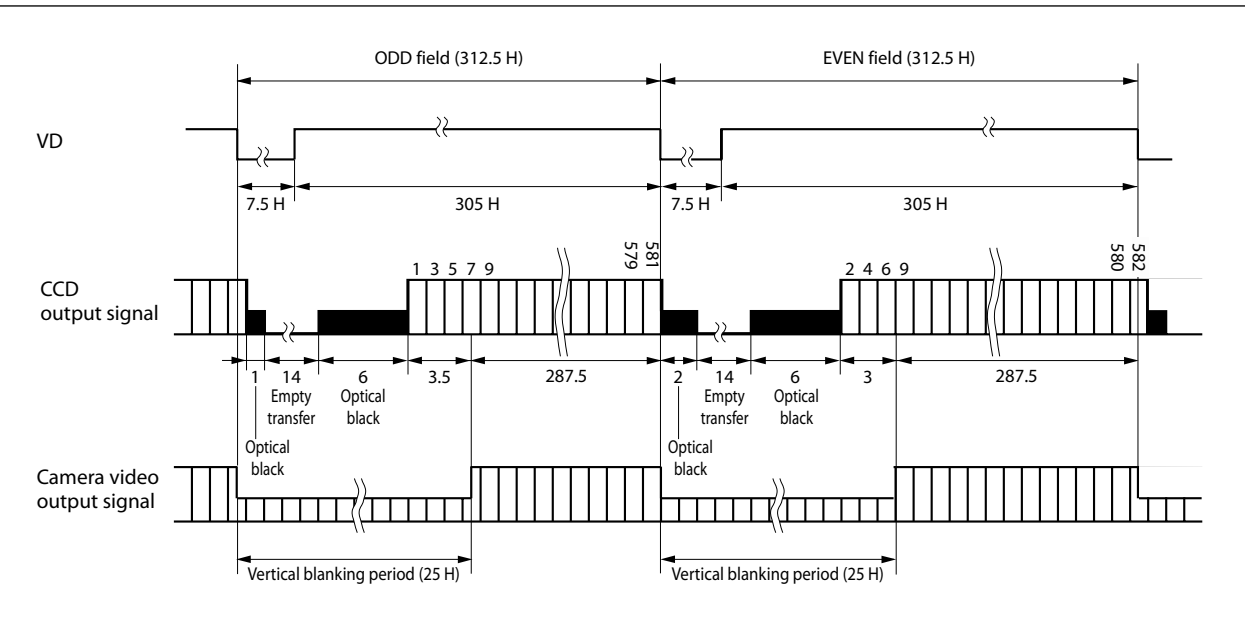
Vertical output waveform timing chart (2:1 Interlace/Field accumulation)



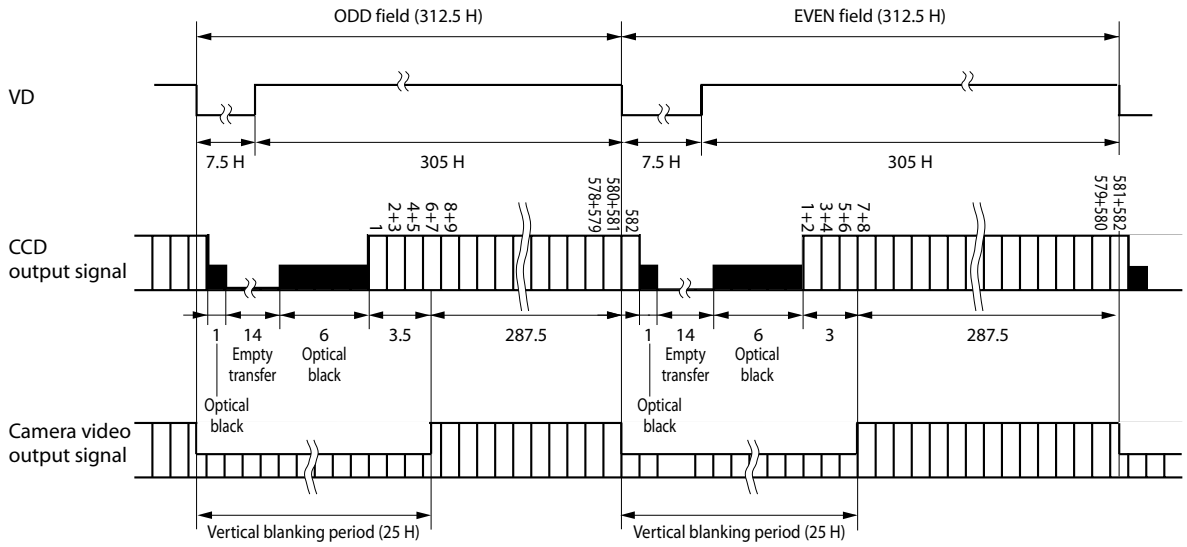
Horizontal output waveform timing chart



Vertical output waveform timing chart (2:1 Interlace/Frame accumulation)



Vertical output waveform timing chart (2:1 Interlace/Field accumulation)

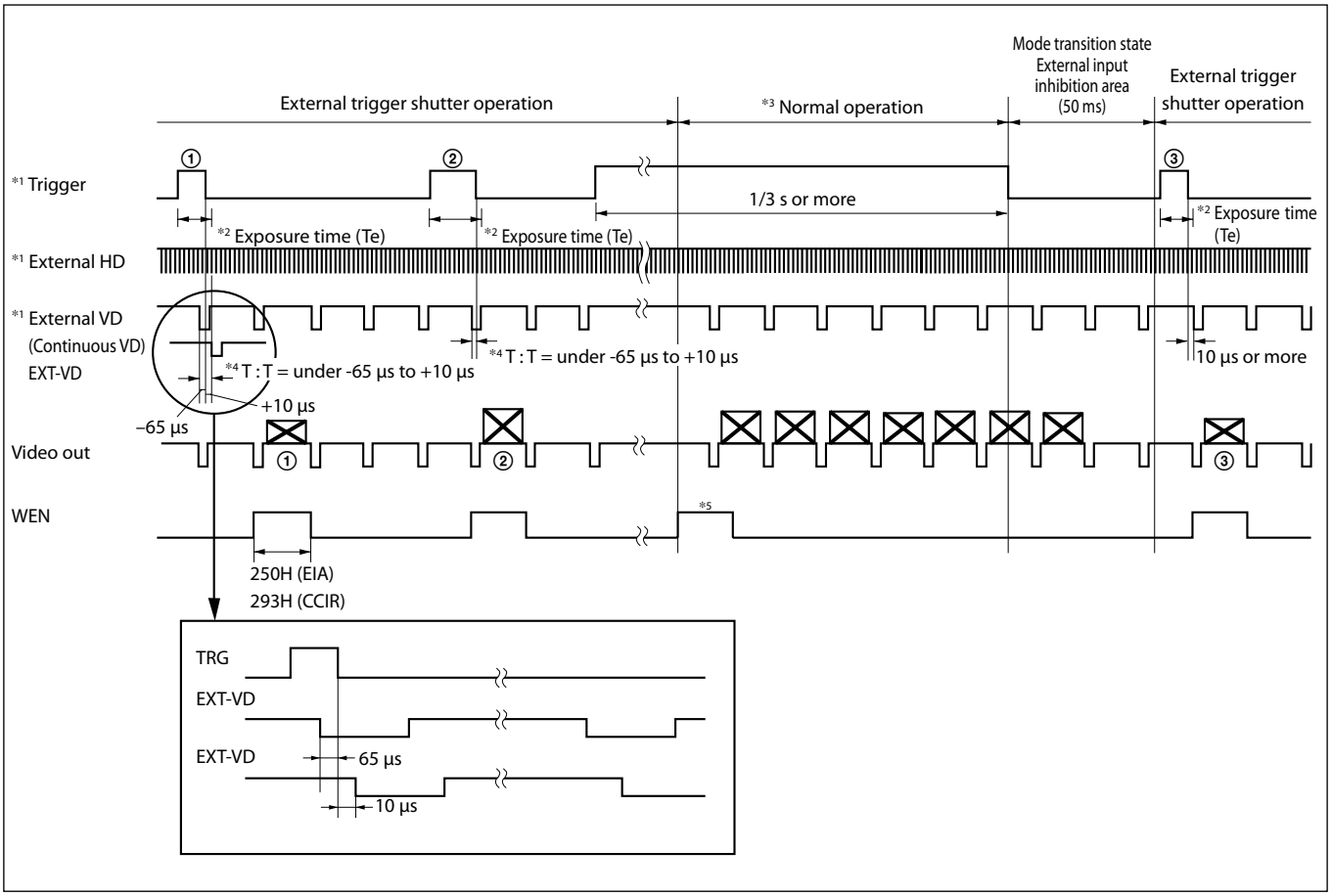


External Trigger Shutter Timing Chart · Mode 1
(Non-reset mode)

Setting the shutter speed using trigger pulse width

HD/VD input

Continuous VD input



*1: This is an external input signal. The cycle of the continuous VD is one field. Make sure to input both HD and VD signals.
*2: Exposure time (Te) Te = Trigger pulse width + 97 µs (EIA), Te = Trigger pulse width + 120 µs (CCIR)
(The effective trigger pulse width for the external trigger shutter operation is between 2 µs and 1/4 s.)
*3: Normal operation is resumed when the trigger pulse width is 1/3 s or more. The trigger falling edge restores the external trigger shutter operation. In this condition, the 50 ms after the falling edge of the trigger pulse is an inhibited external trigger input area. There is no guarantee of operation for any trigger input in this period.
*4: If there is a falling edge on the external VD within the period -65 to +10 µs from the falling trigger edge (① and ② in the figure), it is not defined whether the image is output for the external VD falling edge or the image is output for the next external VD falling edge. (① in the figure shows that the image is output for the next external VD. ② shows the image for the external VD.) In this case, refer to WEN since output of the image and WEN make up a pair. In any other case, the image is output for the external VD falling edge after the trigger falling edge (③ in the figure).
*5: When the external trigger shutter changes to the normal operation, a single WEN pulse is output.

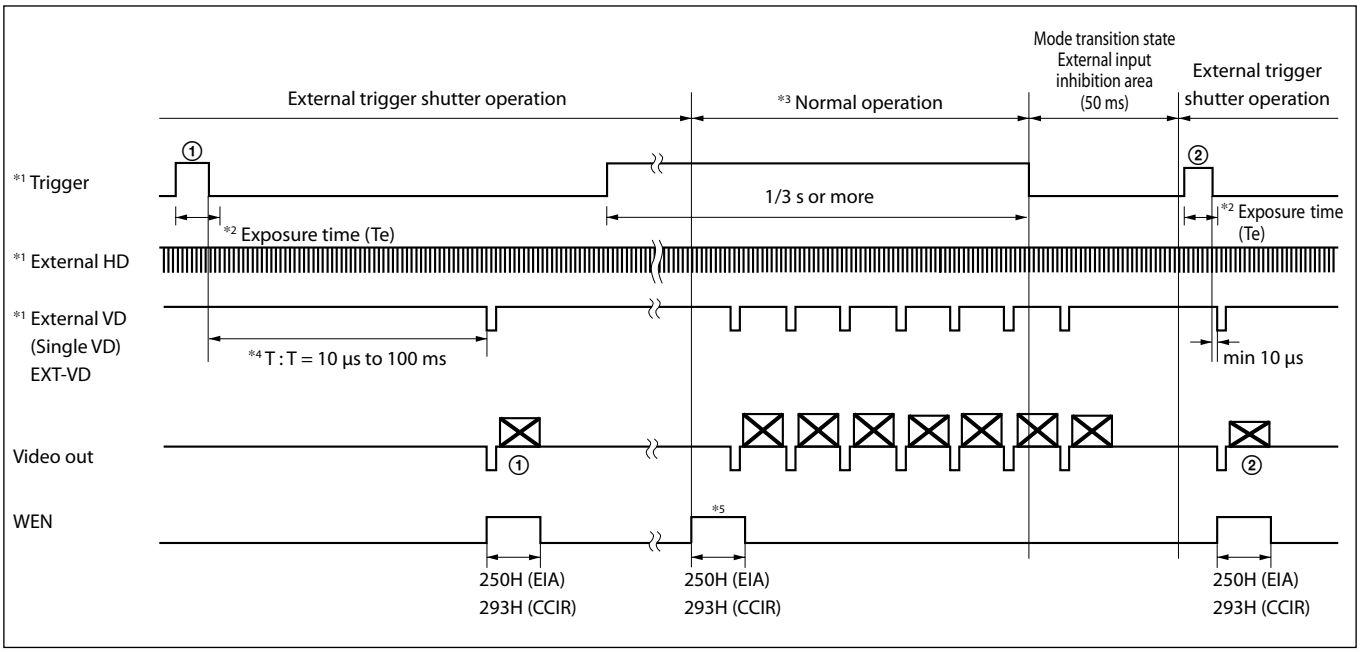
Note

An image is multi-layered when the next trigger is input before the image for the previous trigger has been output.

Setting the shutter speed using trigger pulse width

HD/VD input

Continuous HD input/Single VD input



*1: This is an external input signal. Make sure to input both HD and VD signals in this case. Input the signal so that the VD phase aligns with the HD falling edge.

*2: Exposure time (Te) Te = Trigger pulse width + 97 µs (EIA), Te = Trigger pulse width + 120 µs (CCIR)
(The effective trigger pulse width for the external trigger shutter operation is between 2 µs and 1/4 s.)

*3: Normal operation is resumed when the trigger pulse width is 1/3 s or more. (An image is output by inputting the continuous VD in this period.) The trigger falling edge restores the external trigger shutter operation. In this condition, the 50 ms after the falling edge of the trigger pulse is an inhibited external trigger input area. There is no guarantee of operation for any trigger input in this period.

*4: Input the external VD within the period 10 µs to 100 ms after the trigger falling edge (① and ② in the figure). There is no guarantee of operation for any other input. If an invalid signal is input, the input is changed to a valid signal and after several V signals, normal operation is resumed.

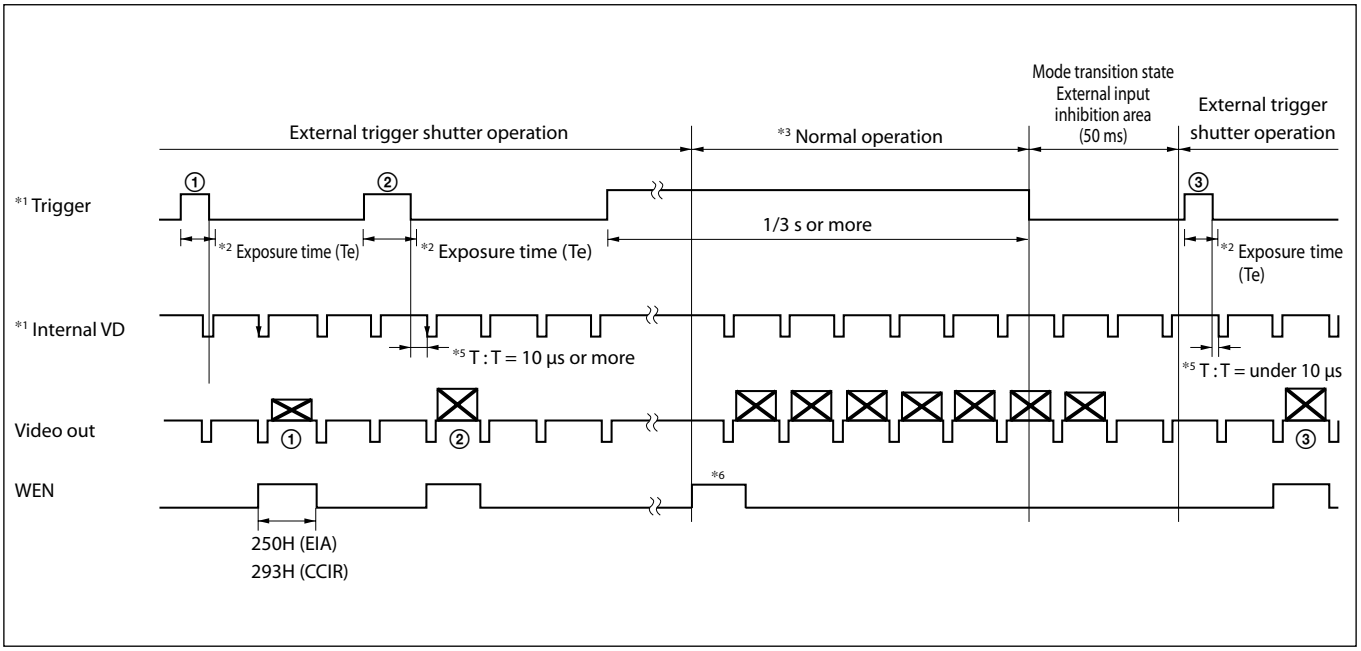
*5: When the external trigger shutter changes to the normal operation, a single WEN pulse is output.

Note

Make sure that the trigger signal and the VD signal make up a pair. The image is multi-layered when the next trigger is input before the image for the previous trigger has been output.

Setting the shutter speed using trigger pulse width

No HD/VD input (Internal synchronization)



*1: This is an external input signal.
*2: Exposure time (Te) Te = Trigger pulse width + 97 µs (EIA), Te = Trigger pulse width + 120 µs (CCIR)
(The effective trigger pulse width for the external trigger shutter operation is between 2 µs and 1/4 s.)
*3: Normal operation is resumed when the trigger pulse width is 1/3 s or more. The trigger falling edge restores the external trigger shutter operation. In this condition, the 50 ms after the falling edge of the trigger pulse is an inhibited external trigger input area. There is no guarantee of operation for any trigger input in this period.
*4: The internal VD signals are output as long as there is no external input and the INT/EXT switch on the rear panel is set to INT.
*5: In external trigger operation, the image is output for the internal VD falling edge after the trigger falling edge (① and ② in the figure). If the period from the trigger falling edge to the internal VD falling edge (T in the figure) is under 10 µs, it is not defined whether the image is output for the internal VD falling edge or the image is output for the next internal VD falling edge. (③ in the figure shows that the image is output for the next internal VD). In this case, refer to WEN since the image and WEN make up a pair. (The internal VD falling edge and the beginning of the equivalent pulse in the V period of SYNC are the same phase.)
*6: When the external trigger shutter changes to the normal operation, a single WEN pulse is output.

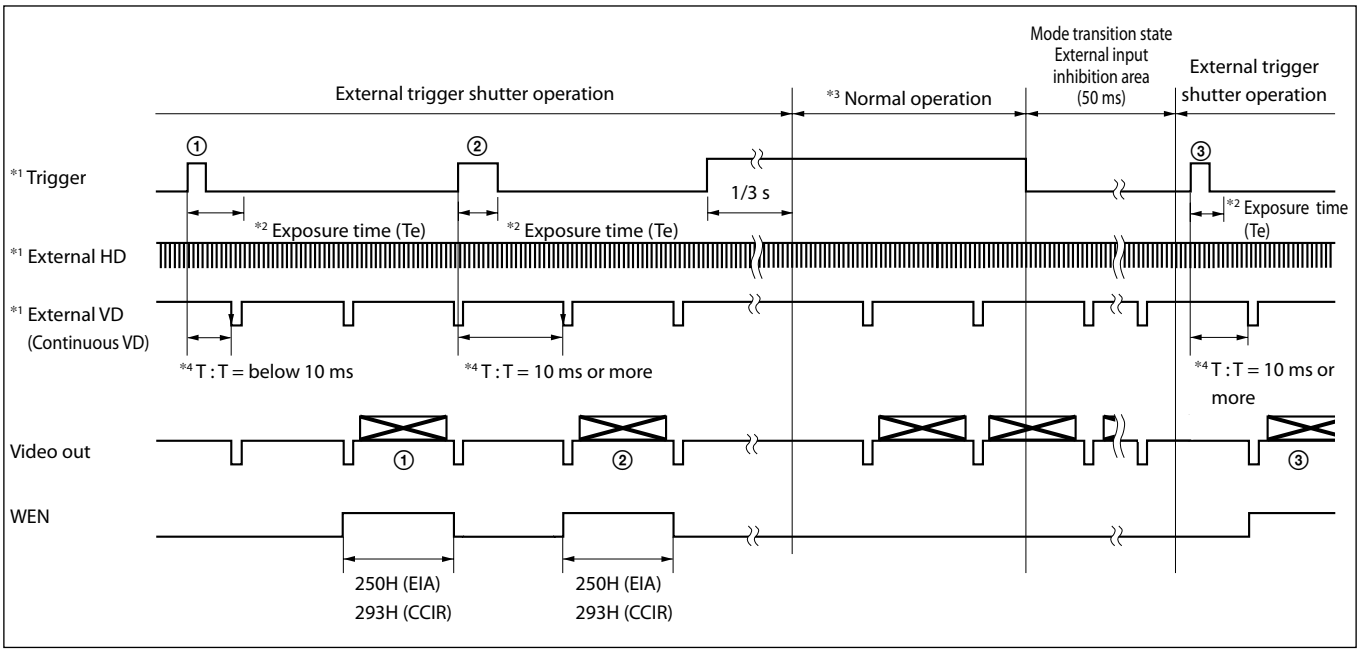
Note

An image is multi-layered when the next trigger is input before the image for the previous trigger has been output.

Setting the shutter speed using DIP switches

HD/VD input

Continuous VD input



*1: This is an external input signal. The cycle of the continuous VD is one field. Make sure to input both HD and VD signals.
*2: The exposure time (Te) is determined by the setting of DIP switches as shown in the table on page 11.
*3: Normal operation is resumed when the trigger pulse width is 1/3 s or more. The trigger falling edge restores the external trigger shutter operation. In this condition, the 50 ms after the falling edge of the trigger pulse is an inhibited external trigger input area. There is no guarantee of operation for any trigger input in this period.
*4: An image is output when an external VD signal falls 10 ms or more after a trigger pulse rises (② and ③ in the figure). If the period from the trigger rising edge to the external VD falling edge (T in the figure) is under 10 ms, it is not defined whether the image is output for the external VD falling edge or the image is output for the next external VD falling edge. (① in the figure shows that the image is output for the next external VD). In this case, refer to WEN since the image and WEN make up a pair.

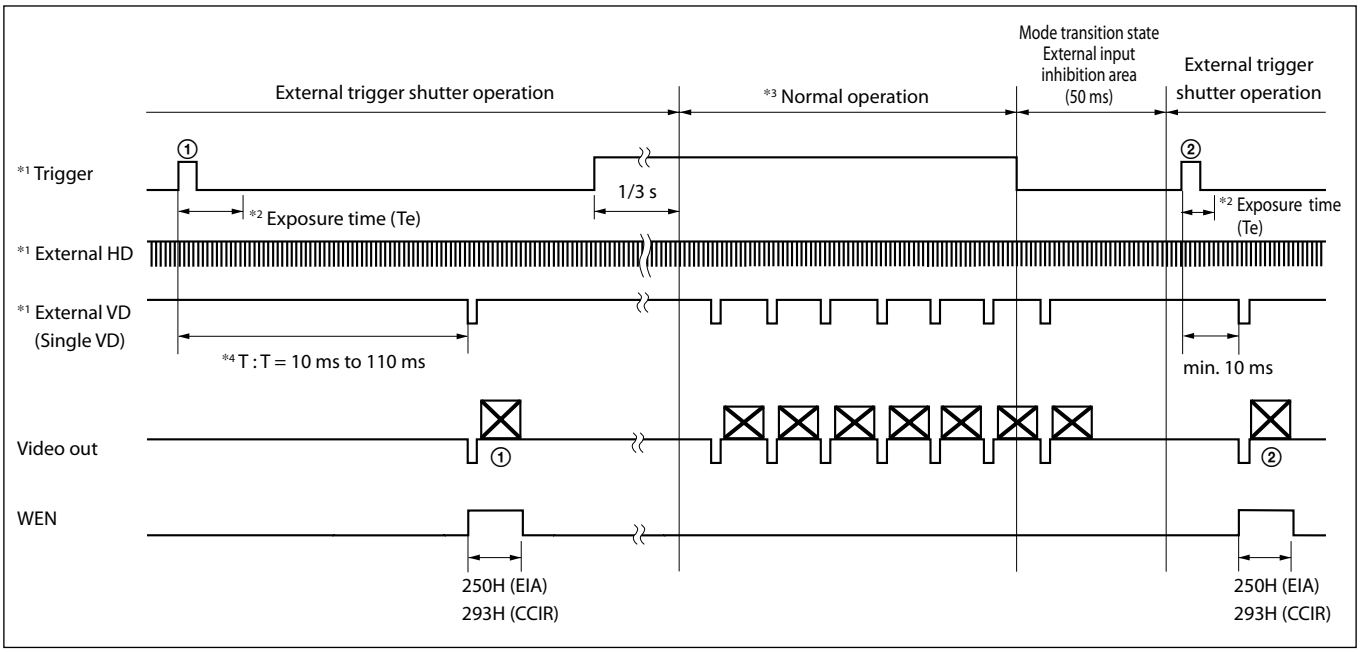
Note

An image is multi-layered when the next trigger is input before the image for the previous trigger has been output.

Setting the shutter speed using DIP switches

HD/VD input

Continuous HD input/Single VD input



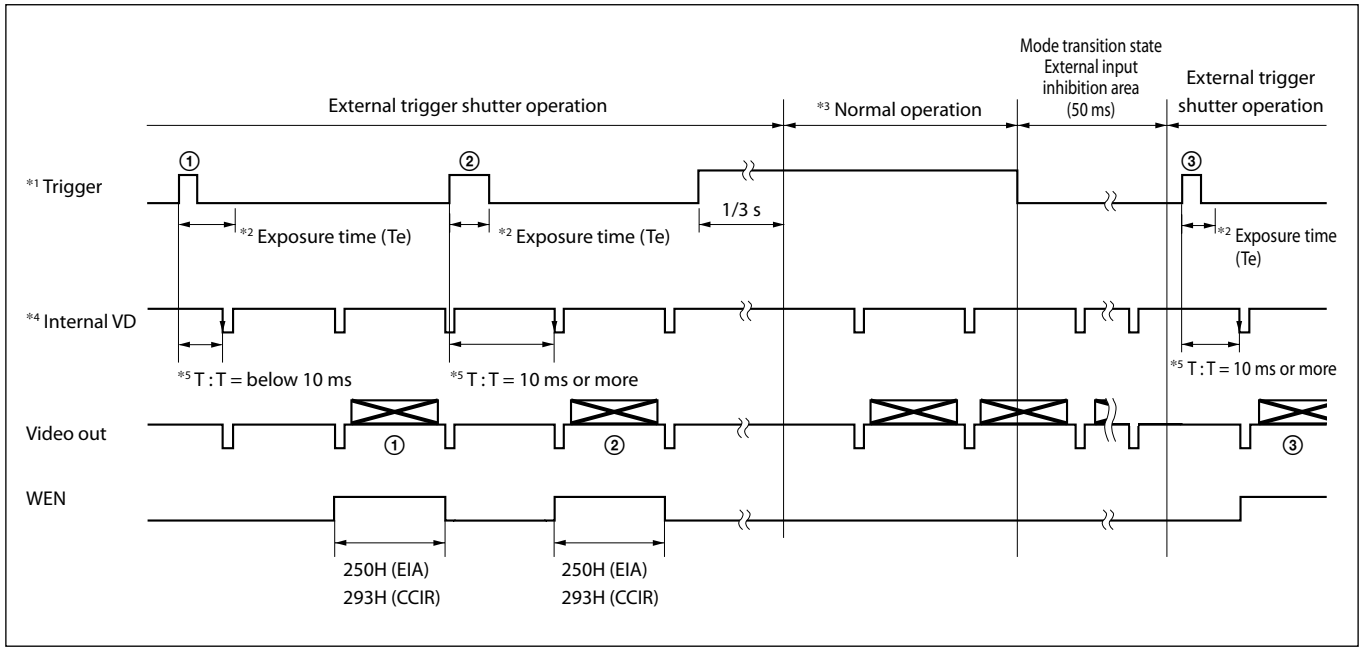
*1: This is an external input signal. Make sure to input both HD and VD signals in this case. Input the signal so that the VD phase aligns with the HD falling edge.
*2: The exposure time (Te) is determined by the setting of DIP switches as shown in the table on page 11.
*3: Normal operation is resumed when the trigger pulse width is 1/3 s or more. (An image is output by inputting the continuous VD in this period.) The trigger falling edge restores the external trigger shutter operation. In this condition, the 50 ms after the falling edge of the trigger pulse is an inhibited external trigger input area. There is no guarantee of operation for any trigger input in this period.
*4: Input the external VD within the period 10 ms to 110 ms after the trigger rising edge (① and ② in the figure). There is no guarantee of operation for any other input. If an invalid signal is input, the input is changed to a valid signal and after several V signals, normal operation resumes.

Note

Make sure that the trigger signal and the VD signal make up a pair. An image is multi-layered when the next trigger is input before the image for the previous trigger has been output.

Setting the shutter speed using DIP switches

No HD/VD input (Internal synchronization)



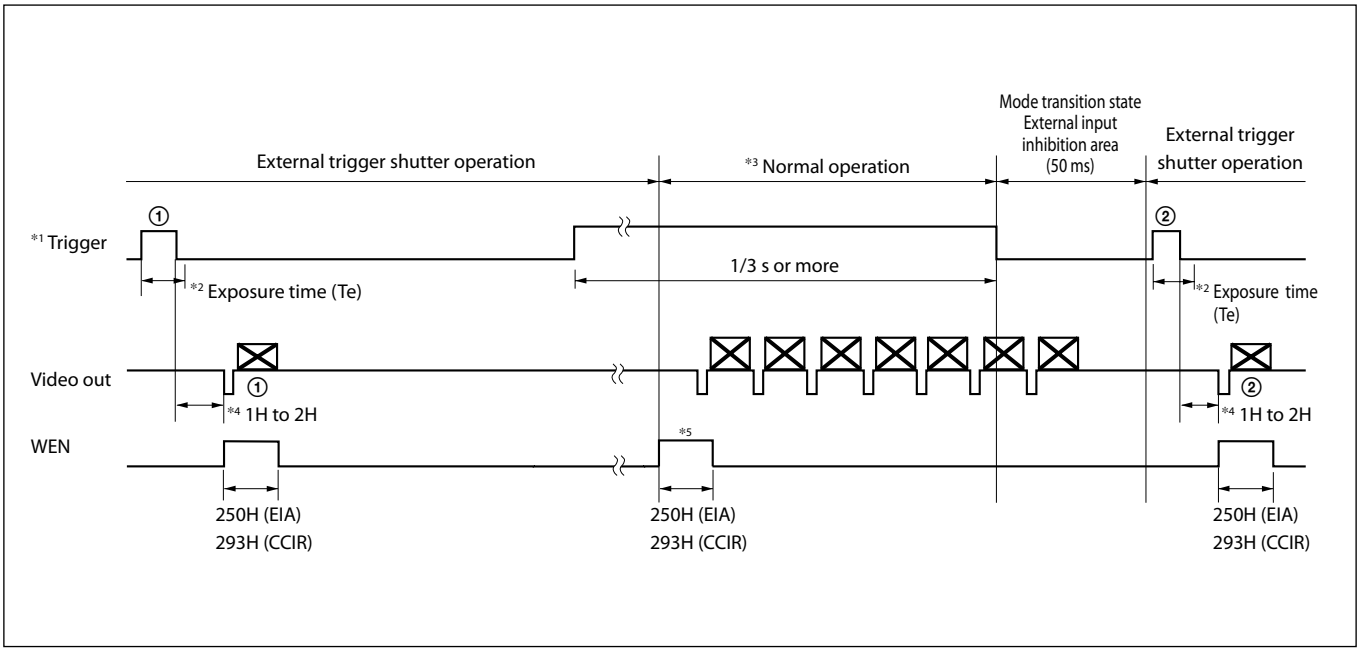
*1: This is an external input signal.
*2: The exposure time (Te) is determined by the setting of DIP switches as shown in the table on page 11.
*3: Normal operation is resumed when the trigger pulse width is 1/3 s or more. The trigger falling edge restores the external trigger shutter operation. In this condition, the 50 ms after the falling edge of the trigger pulse is an inhibited external trigger input area. There is no guarantee of operation for any trigger input in this period.
*4: The internal VD signals are output as long as there is no external input and the INT/EXT switch on the rear panel is set to INT.
*5: An image is output when an internal VD signal falls 10 ms or more after a trigger pulse rises (② and ③ in the figure). If the period from the trigger rising edge to the internal VD falling edge (T in the figure) is under 10 ms, it is not defined whether the image is output for the external VD falling edge or the image is output for the next external VD falling edge. (① in the figure shows that the image is output for the next internal VD). In this case, refer to WEN since the image and WEN make up a pair. (The internal VD falling edge and the beginning of the equivalent pulse in the V period of SYNC are the same phase.)

Note

An image is multi-layered when the next trigger is input before the image for the previous trigger has been output.

External Trigger Shutter Timing Chart · Mode 2
(Reset mode)

Setting the shutter speed using trigger pulse width



*1: This is an external input signal. The trigger input cycle must be the trigger pulse width + 1 field + 2H or more. When a shorter cycle is used, there is no guarantee of operation. If an invalid signal is input, the input is changed to a valid signal and after several V signals, normal operation resumes.

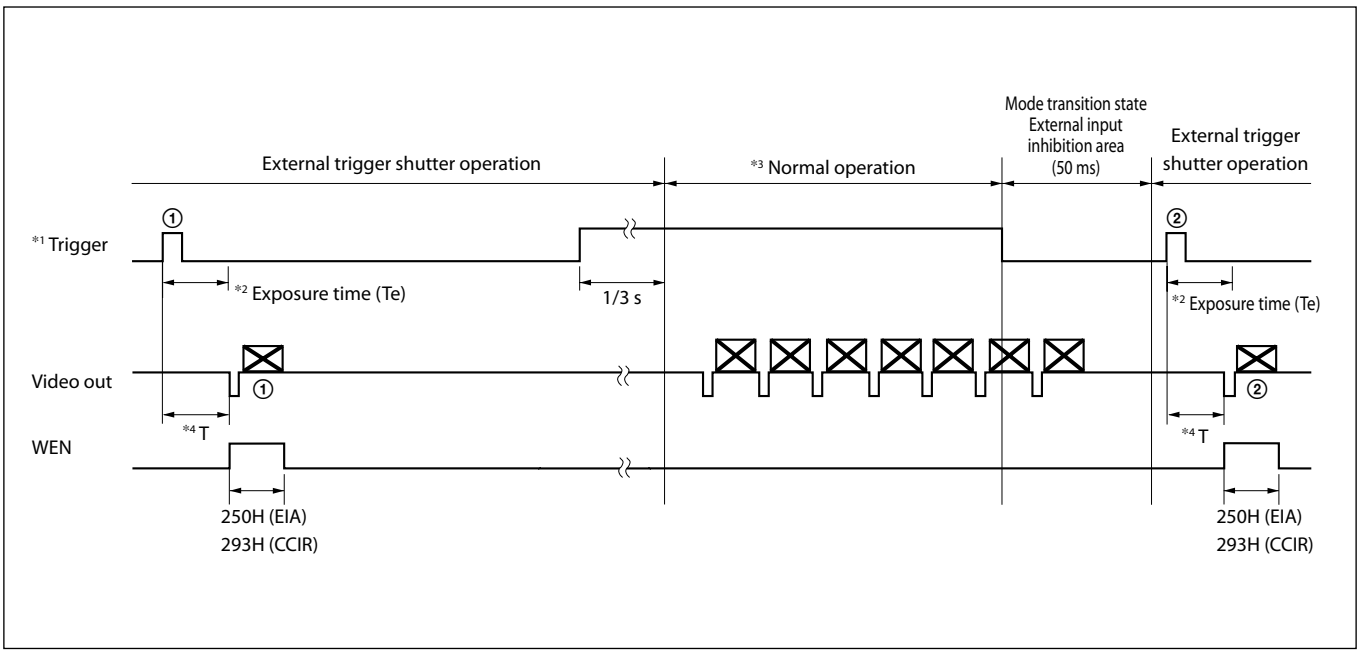
*2: Exposure time (Te) Te = Trigger pulse width + 97 µs (EIA), Te = Trigger pulse width + 120 µs (CCIR)
(The effective trigger pulse width for the external trigger shutter operation is between 2 µs and 1/4 s.)

*3: Normal operation is resumed when the trigger pulse width is 1/3 s or more. The trigger falling edge restores the external trigger shutter operation. In this condition, the 50 ms after the falling edge of the trigger pulse is an inhibited external trigger input area. There is no guarantee of operation for any trigger input in this period.

*4: The VD signal is output after 1 H to 2 H from the trigger falling edge and in synchronization with that, an image is output.

*5: When the external trigger shutter changes to the normal operation, a single WEN pulse is output.

Setting the shutter speed using the DIP switches



*1: This is an external input signal. The trigger input cycle must be the shutter speed (the DIP switches) + 1 field + 2H or more. When a shorter cycle is used, there is no guarantee of operation. If an invalid signal is input, the input is changed to a valid signal and after several V signals, normal operation resumes.

*2: The exposure time (Te) is determined by the setting of DIP switches as shown in the table on page 11.

*3: Normal operation is resumed when the trigger pulse width is 1/3 s or more. The trigger falling edge restores the external trigger shutter operation. In this condition, the 50 ms after the falling edge of the trigger pulse is an inhibited external trigger input area. There is no guarantee of operation for any trigger input in this period.

*4: The image is output at the shortest timing from the trigger rising edge according to the DIP switch setting.

Specifications

Main Specifications

Image pickup device
2/3 inch interline transfer CCD
Number of effective pixels
XC-ST70: 768(H) × 494(V)
XC-ST70CE: 752(H) × 582(V)
CCD horizontal driving frequency
XC-ST70: 14.318 MHz
XC-ST70CE: 14.187 MHz
CCD vertical driving frequency
XC-ST70: 15.734 kHz
XC-ST70CE: 15.625 kHz
Signal system EIA/CCIR
Cell size XC-ST70: 11.6 (H) × 13.5 (V) µm
XC-ST70CE: 11.6 (H) × 11.2 (V) µm
Lens mount C-mount
Flange focal length 17.526 mm ($^{11}/_{16}$ inch)
Synchronization system
Internal/External (automatically switches)
External synchronization input/output
HD/VD (2 to 5 Vp-p),
VS (SYNC level: 0.3 Vp-p $^{+0.3\ V}_{-0.15\ V}$)
* When the switch on the rear panel is set to EXT, automatically changed according to input signal.
Allowable frequency deviation of external synchronization
±1% (in horizontal synchronous frequency)
Jitter Less than ±50 ns
Scanning system 2 : 1 interlace
Non-interlace (when inputting external synchronization)
Horizontal resolution
XC-ST70: 570 TV lines
XC-ST70CE: 560 TV lines
Sensitivity 400 lx F8 (γ = ON, 0 dB)
S/N ratio XC-ST70: 60 dB
XC-ST70CE: 58 dB
Minimum illumination
0.3 lx (F1.4, AGC ON)
Gain AGC/Manual/Fixed
(This setting can be changed on the rear panel.)
Gamma correction ON/OFF
(This setting can be changed on the rear panel.)
Electric shutter XC-ST70: 1/100 to 1/10,000 s
XC-ST70CE: 1/120 to 1/10,000 s
External trigger shutter
XC-ST70: 1/4 to 1/10,000 s
XC-ST70CE: 1/4 to 1/8,000 s
* This setting can be changed by the trigger pulse width or set by the DIP switches on the rear panel.
Power requirements
DC+12 V (+10.5 V to 15 V)
Power consumption
2.1 W
Operating temperature
–5 ˚C to +45 ˚C (23 ˚F to 113 ˚F)
Storage temperature
–30 ˚C to +60 ˚C (–22 ˚F to 140 ˚F)
Performance guarantee temperature
0 ˚C to 40 ˚C (32 ˚F to 104 ˚F)
Operating humidity
20 to 80% (no condensation)
Storage humidity 20 to 95% (no condensation)
Vibration resistance
10 G (20 to 200 Hz/in the directions X, Y, and Z for 20 min)
Shock resistance 70 G
External dimensions (w/h/d)
44 (W) × 29 (H) × 57.5 (D) mm ($1\ ^3/_4 \times 1\ ^3/_{16} \times 2\ ^3/_8$ inches)
Mass 105 g (3.7 oz)
Various standards UL1492, FCC Class A Digital Device, CE (EN50081-2 + EN50082-2)
Others Restart/Reset functions
Selection of the frame/field accumulation
Conforms to new EIAJ 12-pin assignments
Accessories Lens mount cap (1)
Operating Instructions (1)

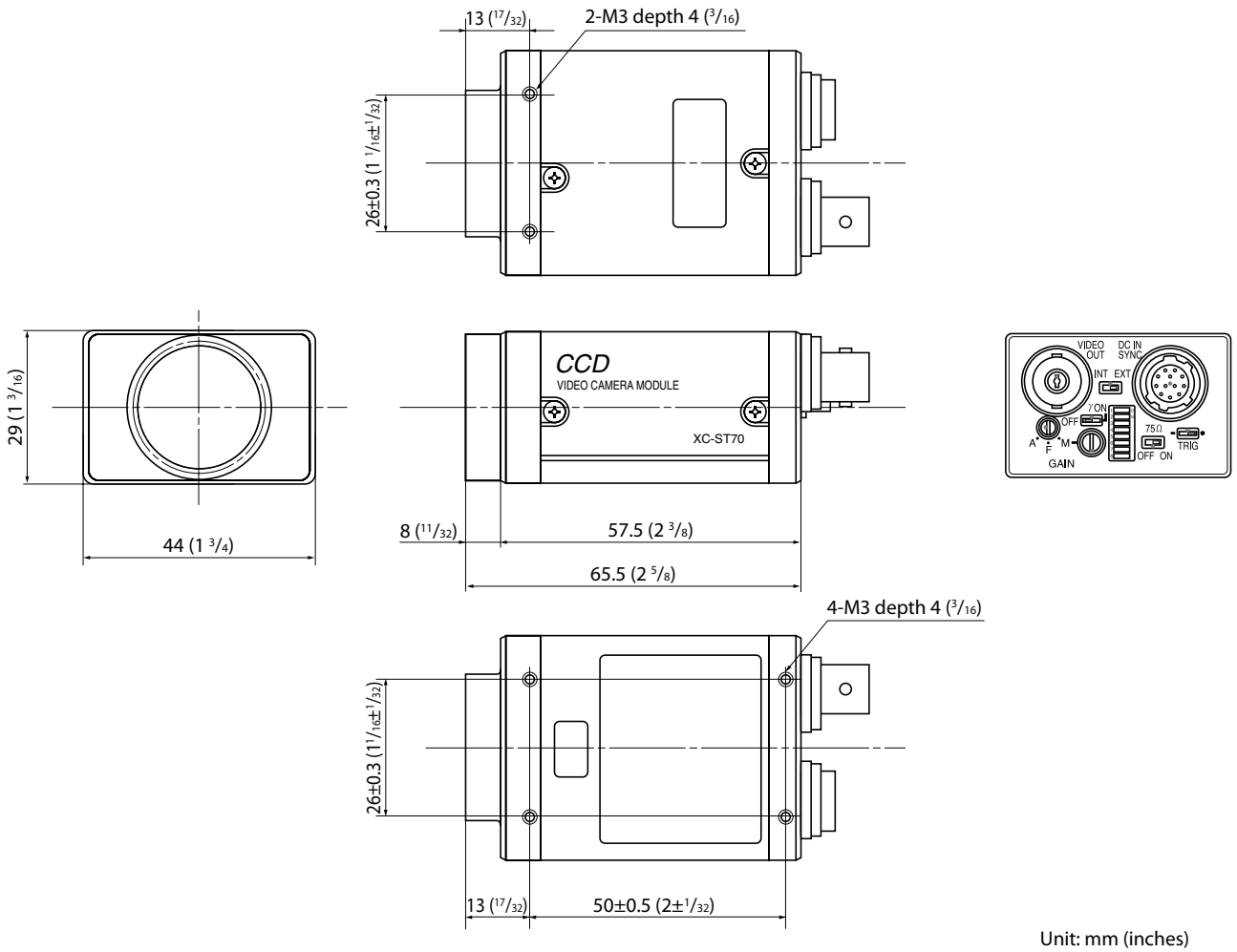
External/internal synchronizations by each mode

Modes		Internal synchronization	External synchronization	
			HD/VD	VS
Normal		○	○	○
Normal shutter		○	○	○
External trigger shutter	Mode 1	○	○	×
	Mode 2	Internal VD (single) signals occur by inputting the trigger signal.	×	×
Restart/Reset		×	○	×

○: Available
×: Not available

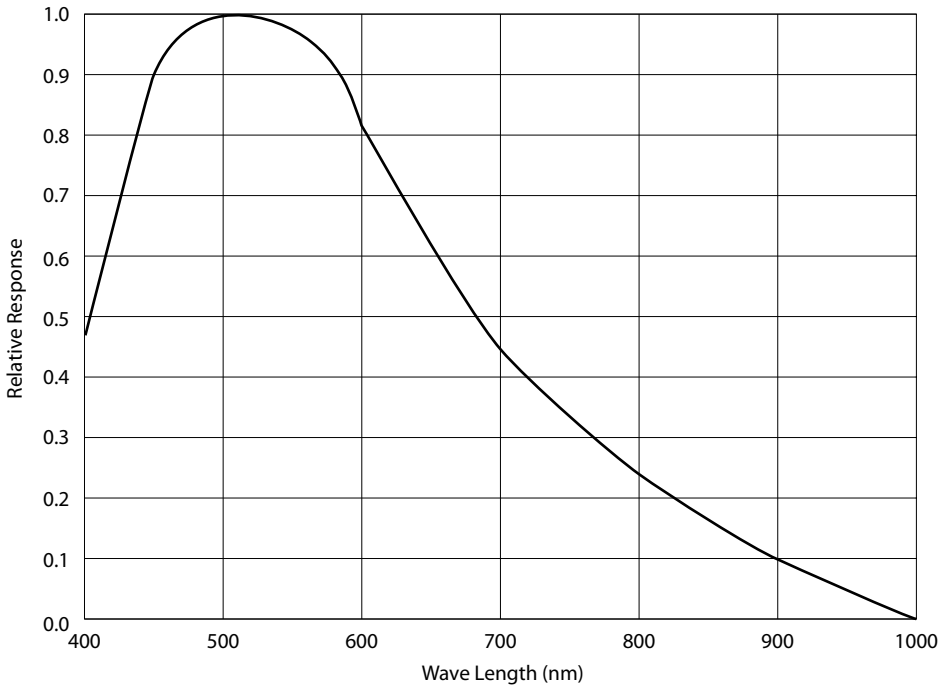
Dimensions

XC-ST70/70CE



Unit: mm (inches)

Spectral Sensitivity Characteristics (Typical Values)



Selectable Lenses

To select a lens, please refer to the following table showing the lens specifications of available accessories.

Compatible with XC-ST70/70CE

C-mount Lenses List

Model names		VLC-08YM	VLC-12YM	VLC-16Y-M	VLC-25Y-M	VLC-50Y-M
Focal length (mm/inches)		8 (11/32)	12 (1/2)	16 (21/32)	25 (1)	50 (2)
Maximum relative aperture		1 : 1.4	1 : 1.8	1 : 1.4	1 : 1.6	1 : 2.8
Operation	Aperture	Manual	Manual	Manual	Manual	Manual
	Focus	Manual	Manual	Manual	Manual	Manual
Angle of view (H × V)		56.4° × 42.6°	39.9° × 30.5°	30.7° × 23.3°	20.0° × 15.0°	10.1° × 7.6°
MOD (mm/inches)		207 (8 1/4)	208 (8 1/4)	289 (11 1/2)	204 (8 1/8)	438 (17 1/4)
Object dimensions at MOD (H × V) (mm/inches)	XC-ST70	250 × 183 (9 7/8 × 7 1/4)	173 × 127 (6 7/8 × 5)	165 × 122 (6 1/2 × 4 7/8)	72 × 53.5 (2 7/8 × 2 1/8)	68 × 51 (2 3/4 × 2 1/8)
	XC-ST70CE	247 × 180 (9 3/4 × 7 1/8)	167 × 124 (6 5/8 × 5)	160 × 120 (6 3/8 × 4 3/4)	69 × 53 (2 3/4 × 2 1/8)	69 × 49 (2 3/4 × 2)
Back focus (mm/inches)		11.54 (15/32)	10.99 (7/16)	12.5 (1/2)	11.6 (15/32)	22.1 (7/8)
Flange focal length (mm/inches)		17.526 (23/32)	17.526 (23/32)	17.526 (23/32)	17.526 (23/32)	17.526 (23/32)
Mass (g/oz)		40 (1.4)	40 (1.4)	51 (1.8)	42 (1.5)	65 (2.3)

MOD: The minimum object distance between the edge of the lens body and an object.

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