

Operation Manual Ver. 1.1

VGA CCD Black & White Camera

Model

PXA30SHP



Primetech Engineering Corp.

Introduction

Thank you for your purchase of the Primetech Engineering product.

We ensure that you will enjoy this and other products from Primetech Engineering for many years.

- Keep this manual and warranty card handy for future reference.

For Safe Use of the Product

To ensure the safe use of this product, carefully read the warnings and cautions provided below prior to use:

	Warning	Failure to follow the warning message may result in death or serious injury.
	Caution	Failure to follow the caution message may result in injury or property damage.

Warning – Safety Precautions –

- Never disassemble or modify the product.
- Do not touch the connection cable pins or metal parts with wet hands.
- Do not use the product in a place exposed to rain or water droplets or where toxic gases (liquids) are generated nearby.
- If the product will not be used for an extended period of time, unplug the connection cable from the camera.
- When installing, inspecting or handling the product in a high place, implement sufficient measures beforehand to prevent the device and parts from falling.
- If you see smoke, smell a bad odor or hear an abnormal noise, immediately turn off the power supply and unplug the cable from the product.
- Do not use this product in a system that may cause a serious accident if the product exhibits an abnormality.

Caution – Precautions on Use –

- Use the product within the operating temperature range (-5 to +45°C).
- Use the product at the specified power-supply voltage (+12 VDC).
- Avoid any strong impact or vibration to the product.
- Provide sufficient space around the installed product to prevent the product's internal temperature from rising.
- If the product is used in a dusty environment, be sure to implement dust-protection measures.
- Be sure to turn off the power supply after the cable has been unplugged and then plugged in again with the power on.
- Dust and smudges on the surface of the cover glass will appear as black stains on the image. Blow away any dust with air, etc., and wipe off any smudges using a cotton swab moistened with ethyl alcohol. When cleaning smudges, be careful not to scratch the surface of the cover glass.
- It is recommended to use a daylight-color fluorescent lamp or other light source that is free from infrared light. When using a halogen lamp or other light source containing infrared light, use an infrared cutoff filter.
- Do not share the power supply with a motor or other type of noise-generating device.
- The SG (signal ground) and FG (frame ground) are connected inside the camera. Design the system in such a way as to prevent the looping caused by ground potential difference.

Supplemental Note

- A period of 10 to 20 minutes of aging after turning on the power allows more stable images to be captured.

Disclaimer

Primetech Engineering shall assume no responsibility for the following under any circumstance:

- Loss arising from fire, earthquake, a man-made disaster or an act of God; willful or accidental misuse of the product; or use of the product by a third party in an abnormal manner;
- Loss arising from repair or modification performed by the customer;
- Incidental loss (lost business profit, suspension of business, etc.) arising from the use of or inability to use the product; and
- Loss arising from malfunction, etc., caused by the combined use of connected devices.

Revision History

Revision	Date of revision	Description of change
1.0	2019/03/14	Released the initial version.
1.1	2020/07/15	Correction of errors

Table of Contents

1. Overview	6
1.1. Characteristics	6
2. System Configuration	7
3. Connection Diagram	8
4. Specifications of Camera Parts	9
4.1. Front/Top/Bottom	9
4.2. Rear panel	10
4.3. Pin assignment for VIDEO OUT/DC IN/SYNC terminal	12
4.4. Input phase specifications for external VD/HD signal	13
4.5. WEN output specifications	13
4.6. Trigger pulse specifications	14
5. Shutter Speed Setting	15
6. Trigger Mode Setting	16
6.1. Normal Shutter Mode	16
6.2. Restart Reset Mode	16
6.3. External Triggered Shutter Mode	17
6.3.1. Mode1 non-reset mode	17
6.3.2. Mode2 reset mode	17
7. Scanning Mode Setting	18
7.1. All Pixels Readout Mode	18
7.2. Binning Mode	18
7.3. High-rate Scanning Mode	19
8. Timing Chart Individual Modes	20
8.1. Restart Reset mode	20
8.2. External Triggered Shutter Mode	21
8.2.1. Mode1 Non-reset mode	21
8.2.1.1. Shutter speed:Trigger pulse width, VD/HD:Input (continuous input)	21
8.2.1.2. Shutter speed:VD/HD:DIP switch, VD/HD:Input (continuous input)	22
8.2.1.3. Shutter speed:Trigger pulse width, VD/HD:Input(single input)	23
8.2.1.4. Shutter speed:DIP switch, VD/HD:Input(single input)	24
8.2.1.5. Shutter speed:Trigger pulse width, VD/HD:No input	25
8.2.1.6. Shutter speed:DIP switch, VD/HD:No input	26
8.2.2. Mode2 Reset mode	27
8.2.2.1. Shutter speed:Trigger pulse width	27
8.2.2.2. Shutter speed: DIP switch	28
9. Video Output Timing Chart	29
9.1. All Pixels Readout Timing Chart	29
9.2. Binning Readout Timing Chart	30
9.3. 1/2 High-Rate scanning Readout Timing Chart	31
9.4. 1/4 High-Rate scanning Readout Timing Chart	32
10. Specifications	33
10.1. Relative spectral sensitivity characteristics	34
11. External Dimensions	35

1. Overview

This operation manual describes functions and procedures for the industrial analog camera (B/W).

1.1. Characteristics

- **Diverse mode setting**

The following settings can be used by toggling the switch on the rear panel.

- Synchronous input/output
- Shutter speed
- Shutter function: Normal/triggered shutter
- 60fps/30fps switchable
- 1/2 High-rate scanning mode
- 1/4 High-rate scanning mode
- Binning Mode
- Gain control
- 75 Ω termination

- **External synchronization**

Depending on a VD or HD signal input, the camera operates with external synchronization.

- **Internal synchronizing signal output**

Synchronizing signals (VD, HD) can be output via the 12-pin connector by toggling the switch on the rear panel.

- **External triggered shutter function**

A still image can be obtained by inputting a trigger. It allows stable capture of an object that moves at high speed.

- **Restart/reset function**

CCD images can be accumulated according to the length between VD pulses by continuously inputting synchronizing signals (VD, HD) from an external device.

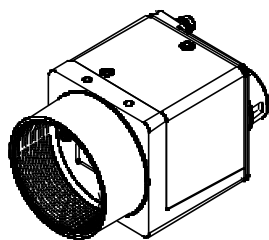
It is effective for long-time exposure. (2VD or more)

- **Camera module fixing**

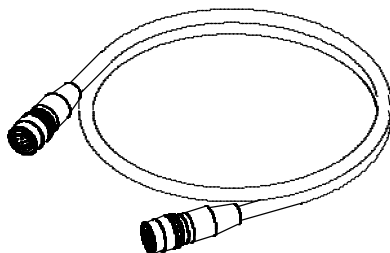
The screw holes for fixing the camera module are located on the lower surface of the front panel that includes the CCD reference plane. Fixing the camera module on the front panel can minimize deviation of the optical axis.

- **Complies with the new 12-pin EIAJ assignment**

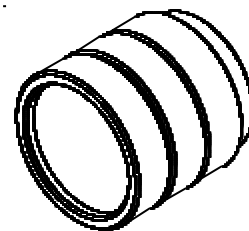
2. System Configuration



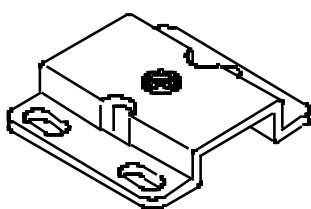
<Video camera module>



<Camera cable>

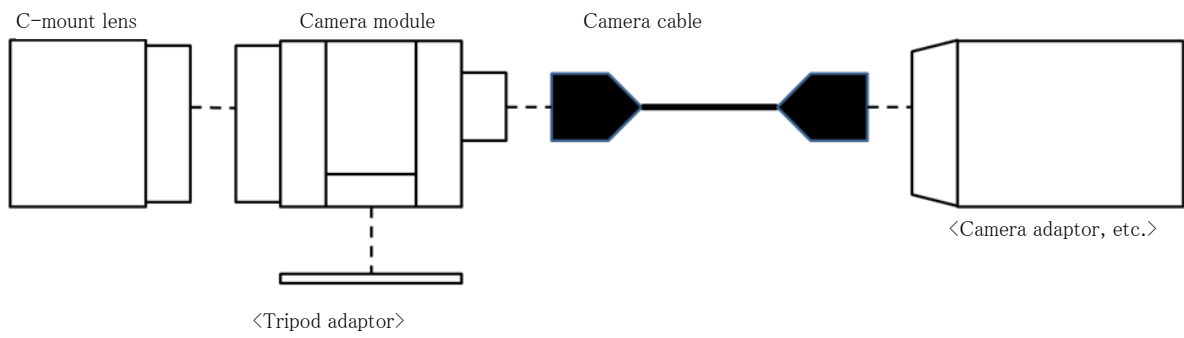


<C-mount lens>



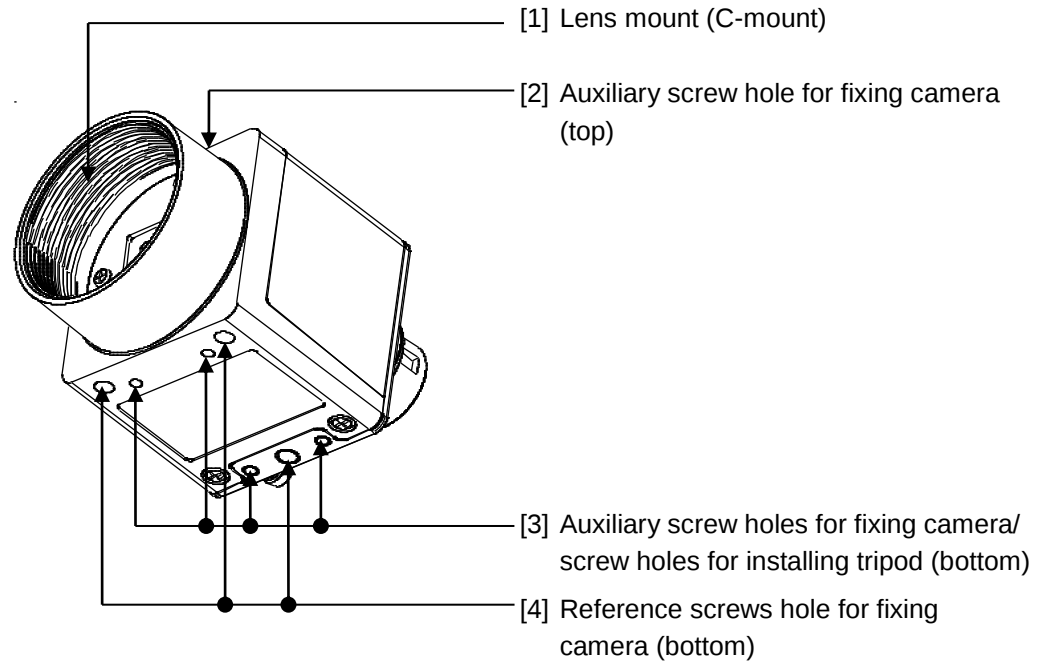
<Tripod adaptor>

3. Connection Diagram



4. Specifications of Camera Parts

4.1. Front/Top/Bottom



[1] Lens mount (C-mount)

Attach a C-mount lens or other optical equipment.

Caution

Use a C-mount lens that does not project more than 9 mm from the lens mount surface.

Be careful to select the lens to attach the camera, as the resolution of the video output from the camera may differ depending on the lens performance. Moreover, the lens performance may vary depending on the aperture value even with a single lens. When sufficient resolution is not attained, change the aperture value.

[2] Auxiliary screw hole for fixing camera (top)

[3] Auxiliary screw holes for fixing camera/screw holes for installing tripod (bottom)

When using a tripod, use these 4 holes to attach a tripod adaptor.

[4] Reference screw holes for fixing camera (bottom)

These holes are used to fix the camera module. Fix the camera module using these holes to minimize the deviation of the optical axis.

Installing a tripod

Install the tripod adaptor (separately sold) onto the camera module before attaching the module to the tripod.

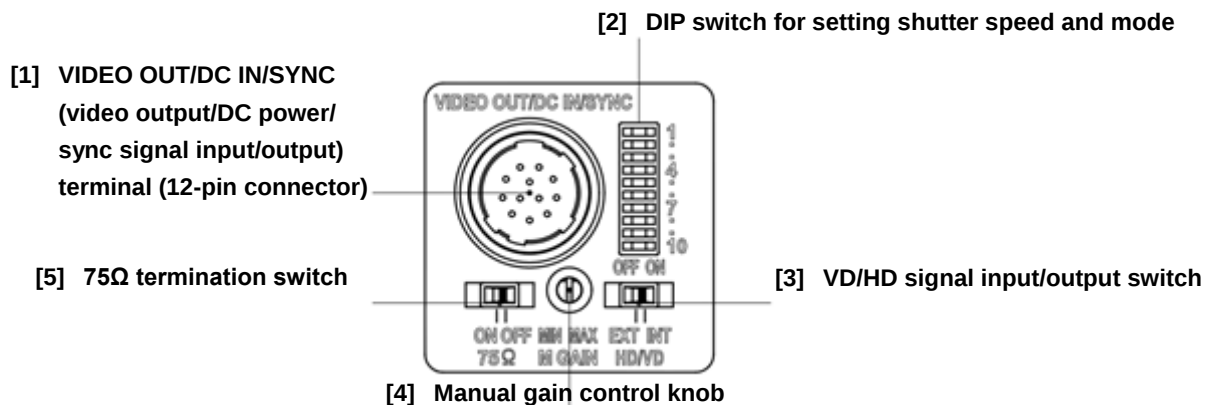
Use a screw that protrudes from the installation surface by 5 mm maximum (ℓ) and firmly tighten it using a hand driver.

Ensure that the protrusion never exceed 5 mm.

Caution

When installing a tripod adaptor (separately sold), be sure to use the screws provided with the adaptor.

4.2. Rear panel

**Caution**

Turn off the module before setting switches.

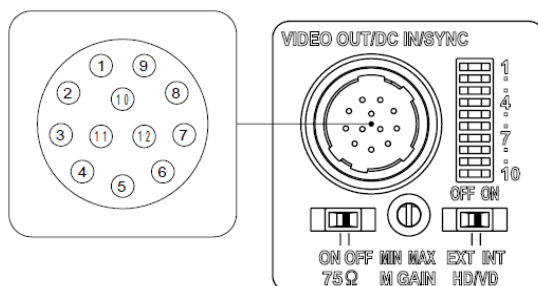
- [1] VIDEO OUT/DC IN/SYNC (video output/DC power/synchronizing signal input/output) terminal (12-pin connector)
By connecting a camera cable, the +12V DC power is supplied and a video signal is output from the camera module. When a synchronizing signal generator is connected and an external synchronizing signal (VD/HD signal) is input, the camera module can be operated in synchronization with an external device.
- [2] DIP switches for setting shutter speed and mode
- Shutter speed setting (bits 1 to 4)
Set a shutter speed. The factory setting for the shutter speed is OFF.
 - Trigger mode setting (bits 5 to 6)
Set a Normal shutter mode, Restart reset mode, Non-reset mode, Reset mode. The factory setting for the shutter is normal shutter mode.
 - Scanning mode setting (bits 7 to 8)
Set a All pixels readout, Binning, 1/2high-rate scanning, 1/4high-rate scanning.
The factory setting is normal shutter mode.
 - Gain switch setting (bit 9)
Set a FIX (fixing) and MANUAL (manual control) modes. The factory setting is FIX.
 - Frame rate setting (bit 10)
Set a 60fps and 30fps. The factory setting is 60fps.
- [3] VD/HD signal input/output toggle switch
Set the switch to the INT side to output VD/HD signals, and set it to the EXT side to input VD/HD signals from an external device. The factory setting for the switch is the EXT side.
- [4] Manual gain control knob
This knob can be used to adjust the gain when manual adjustment is selected using the gain toggle switch among the DIP switches ([2]).
The factory setting for the knob is Mechanical Center.

[5] 75 Ω termination switch

Set the switch to ON for termination. The factory setting is OFF.

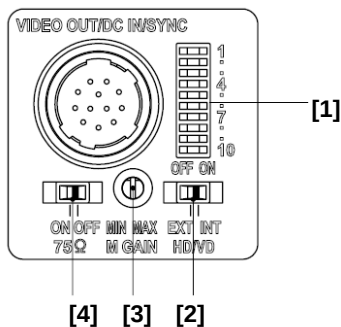
4.3. Pin assignment for VIDEO OUT/DC IN/SYNC (video output/DC power/synchronizing signal input/output) terminal

Rear panel



Pin assignment for VIDEO OUT/DC IN/SYNC (Video output/DC power/synchronizing signal input/output) terminal

Pin No.	Camera synchronizing signal output	External synchronizing signal (VD/HD)	Restart/reset	Externally triggered shutter
1	Ground	Ground	Ground	Ground
2	+12 VDC	+12 VDC	+12 VDC	+12 VDC
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)	WEN output (signal)	WEN output (signal)	WEN output (signal)
11	—	—	—	Trigger pulse input (signal)
12	VD output (ground)	VD input (ground)	Reset (ground)	VD input (ground)

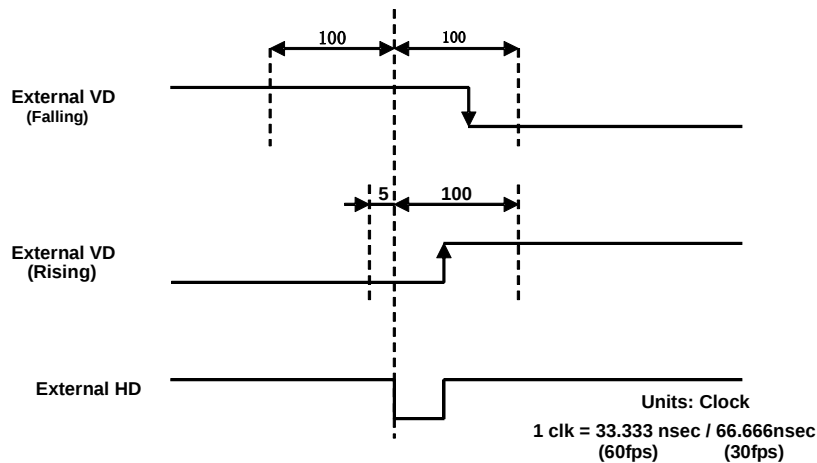


Factory setting mode on the rear panel

No.	Name of switch	Factory setting mode
[1]	DIP switches for setting shutter speed and mode	
	Shutter speed setting (bits 1 to 4)	OFF
	Trigger mode setting (bit 5 to 6)	Normal shutter mode
	Scanning mode setting (bits 7 to 8)	All pixels readout
	Gain switch setting (bit 9)	MANUAL
	Frame rate setting (bit 10)	60FPS
[2]	VD/HD signal input/output toggle switch	EXT
[3]	Manual gain control knob	Mechanical Center*
[4]	75 Ω termination switch	OFF

* When the gain toggle switch is set to MGC, the gain is variable within the range from 0 to 18 dB.

4.4. Input phase specifications for external VD/HD signal



Set the phase relationship for external VD and HD signals as shown in the above figure.

Note that inputs other than those specified above can cause unstable internal reset.

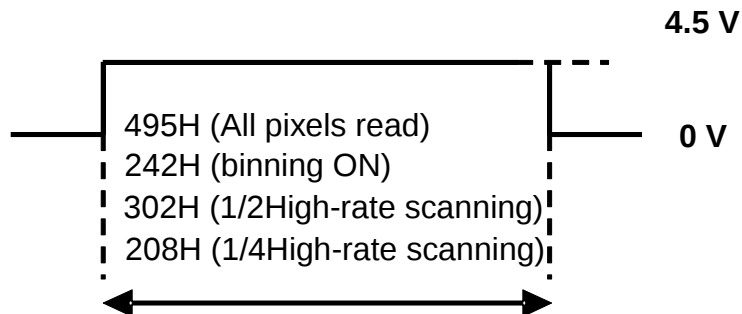
For normal shutter mode

Continuous VD/HD signals

For restart/reset mode / non-reset mode / reset mode

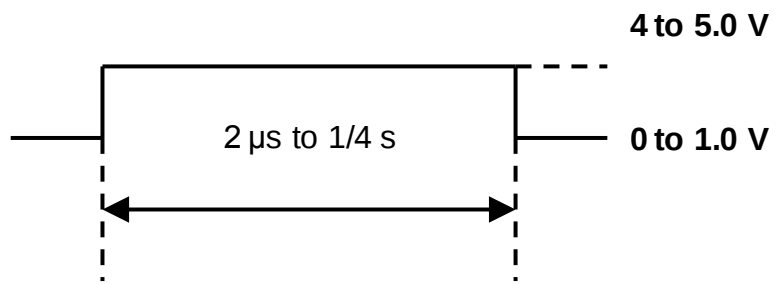
Continuous HD signal. Arbitrary timing for VD signal with the phase relationship between VD and HD within the above specifications

4.5. WEN output specifications



Amplitude levels are representative values when the output terminates at 10 kΩ.

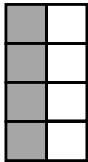
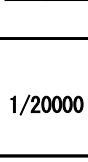
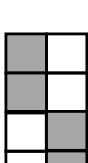
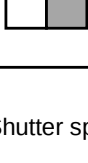
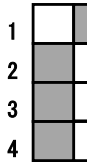
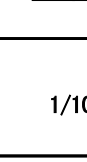
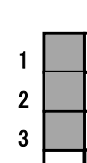
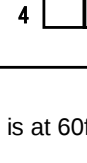
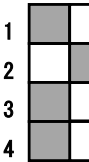
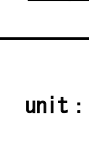
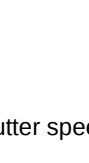
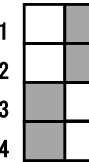
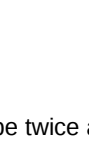
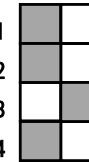
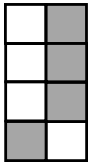
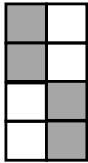
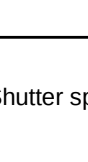
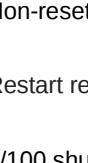
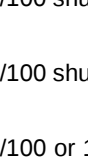
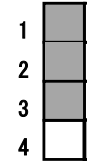
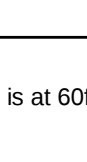
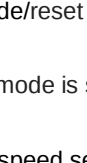
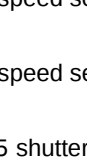
4.6. Trigger pulse specifications



- Input impedance: 10 k Ω or more
- Input the pulse width between 100 μ s and 1/4 s for DIP switch setting.

Input impedance: Enter the voltage value measured at over 10 k Ω .

5. Shutter Speed Setting

OFF	1/125	1/250	1/500	1/1000	1/2000	1/4000	1/10000
1  2  3  4 	1  2  3  4 	1  2  3  4 	1  2  3  4 	1  2  3  4 	1  2  3  4 	1  2  3  4 	1  2  3  4 
1/20000	1/100	unit : sec					
1  2  3  4 	1  2  3  4 						

※Shutter speed is at 60fps. Shutter speed will be twice at 30fps.

※Non-reset mode/reset mode is set, shutter OFF will be pulse width trigger shutter.

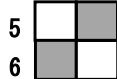
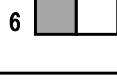
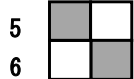
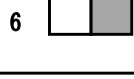
※Restart reset mode is set, shutter speed setting becomes invalid.

※1/100 shutter speed setting at normal shutter mode & binning readout is prohibited because it exceeds the frame rate.

※1/100 shutter speed setting at normal shutter mode & 1/2 high rate scanning is prohibited.

※1/100 or 1/125 shutter speed setting at normal shutter mode & 1/4 high rate scanning is prohibited because it exceeds the frame rate.

6. Trigger Mode Setting

Normal shutter mode	Restart reset mode	Non reset mode	Reset mode
5  6 	5  6 	5  6 	5  6 

6.1. Normal Shutter Mode

Each scan modes are available. In addition, input and output of VD / HD signals.

6.2. Restart Reset Mode

By inputting restart/reset signals (VD/HD) from an external device, you can obtain information for one screen at an arbitrary timing.

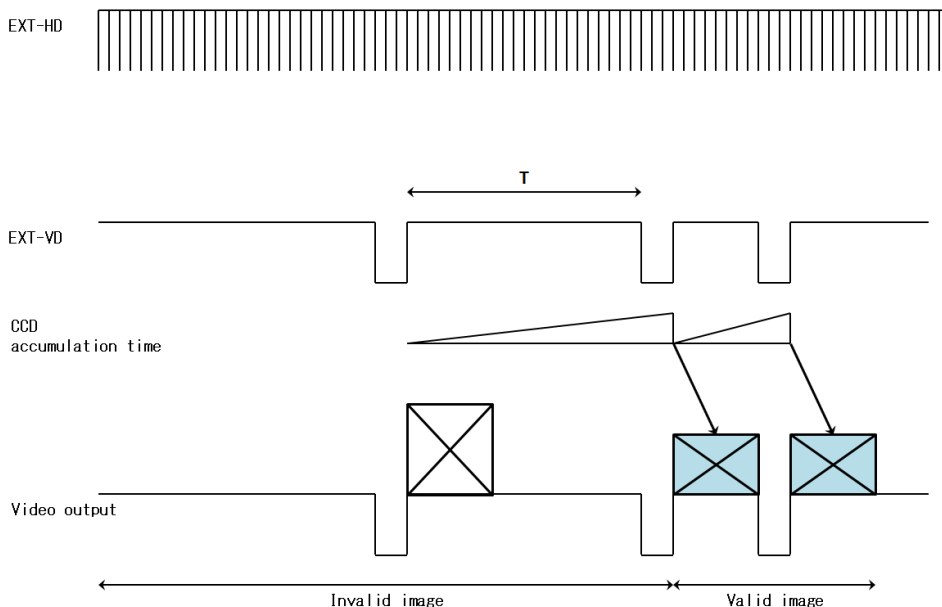
VD enter at intervals of greater than $1V+5H$.

Long-time exposure

By extending the CCD accumulation time using the restart/reset function, you can obtain high-sensitivity images.

It is useful when sensitivity is insufficient under normal usage conditions, or to observe the tracks of a moving object.

To do this, input a VD signal that has a longer period between VD pulses (T in the figure) from an external device.



Caution

During long-time exposure, noticeable white flecks may appear.

6.3. External Triggered Shutter Mode

Inputting a trigger from an external device will enable capturing of high-speed moving objects at a correct position. When the trigger pulse width is set to 1/3 s or more, the output is switched to a normal video signal.

6.3.1. Mode1 non-reset mode

Be inputting the trigger pulse will enable capturing the image at any time.

Be to turn OFF the shutter speed setting, it is also possible to set the exposure time in the trigger pulse width.

Also, Inputting the VD/HD from external device will enable external control of image readout.

A video synchronous with the VD signal is output after a trigger input in this mode.

- When an external VD/HD signal is input: The video synchronizes the external VD signal.

- When an external VD/HD signal is not input: The video synchronizes the internal VD signal.

6.3.2. Mode2 reset mode

In this mode, the internal VD signal is reset, and the video is output after a certain period of time has elapsed since a trigger pulse is input.

Be to turn OFF the shutter speed setting, it is also possible to set the exposure time in the trigger pulse width.

7. Scanning Mode Setting

All pixels readout mode	Binning mode	1/2High-rate scanning mode	1/4High-rate scanning mode
7  8	7  8	7  8	7  8

Scanning Mode	Frame rate (fps)	Scanning lines (Lines)	Video output lines (Lines)
All Pixels Readout Mode	60.01	505	480
Binning Mode	120.25	252	240
1/2High-rate Scanning Mode	97.13	312	245
1/4High-rate Scanning Mode	139.01	218	120

※Frame rate is at 60fps. It will be 1/2 at 30fps.

7.1. All Pixels Readout Mode

It is output the signals of all pixels independent from the video output terminal.

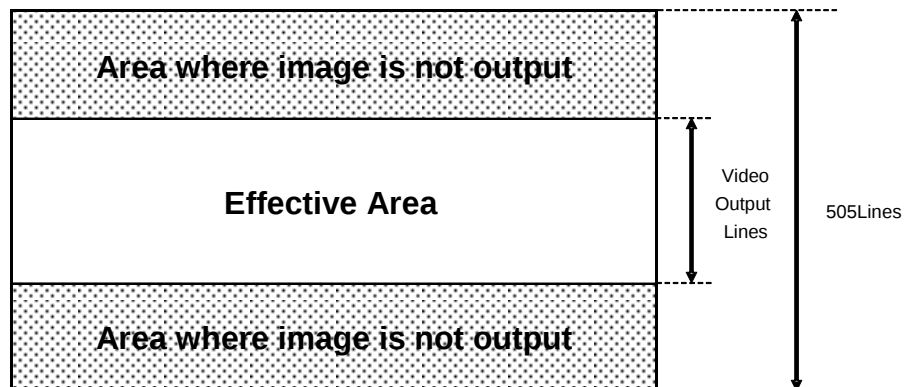
7.2. Binning Mode

It is output the signals of 2 pixels vertical mixing from the video output terminal.

7.3. High-rate Scanning Mode

You can increase the frame rate by setting the high-rate scanning mode.

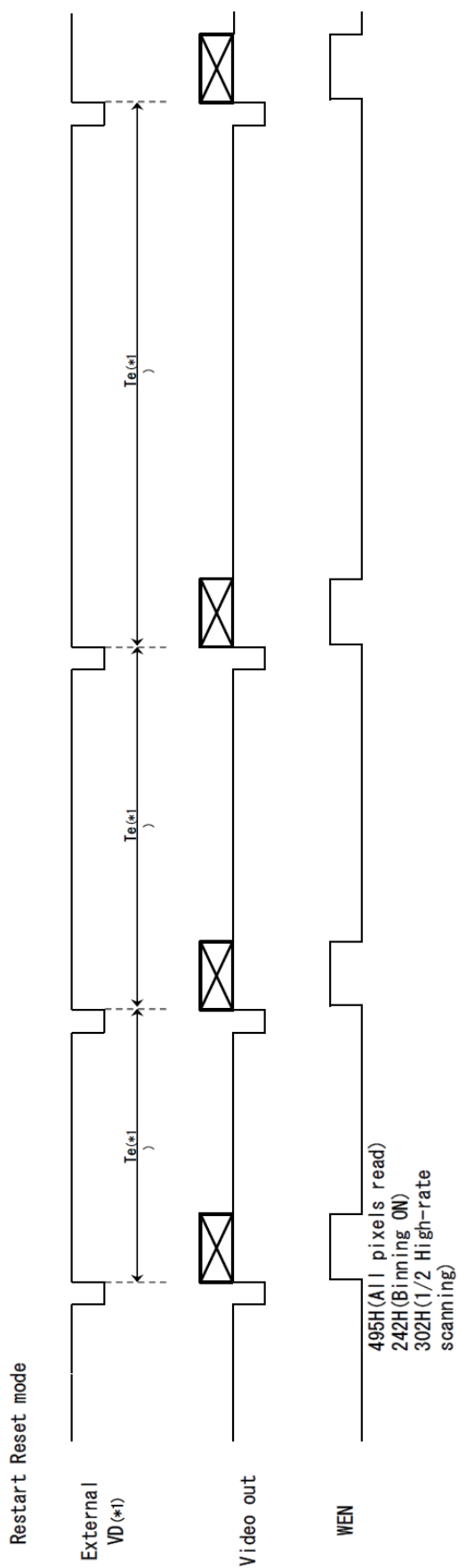
Signal output from the video output terminal is the center of the screen.



Scanning Mode	Frame rate (fps)	Scanning lines (Lines)	Video output lines (Lines)
1/2High-rate Scanning Mode	97.13	312	245
1/4High-rate Scanning Mode	139.01	218	120

8. Timing Chart Individual Modes

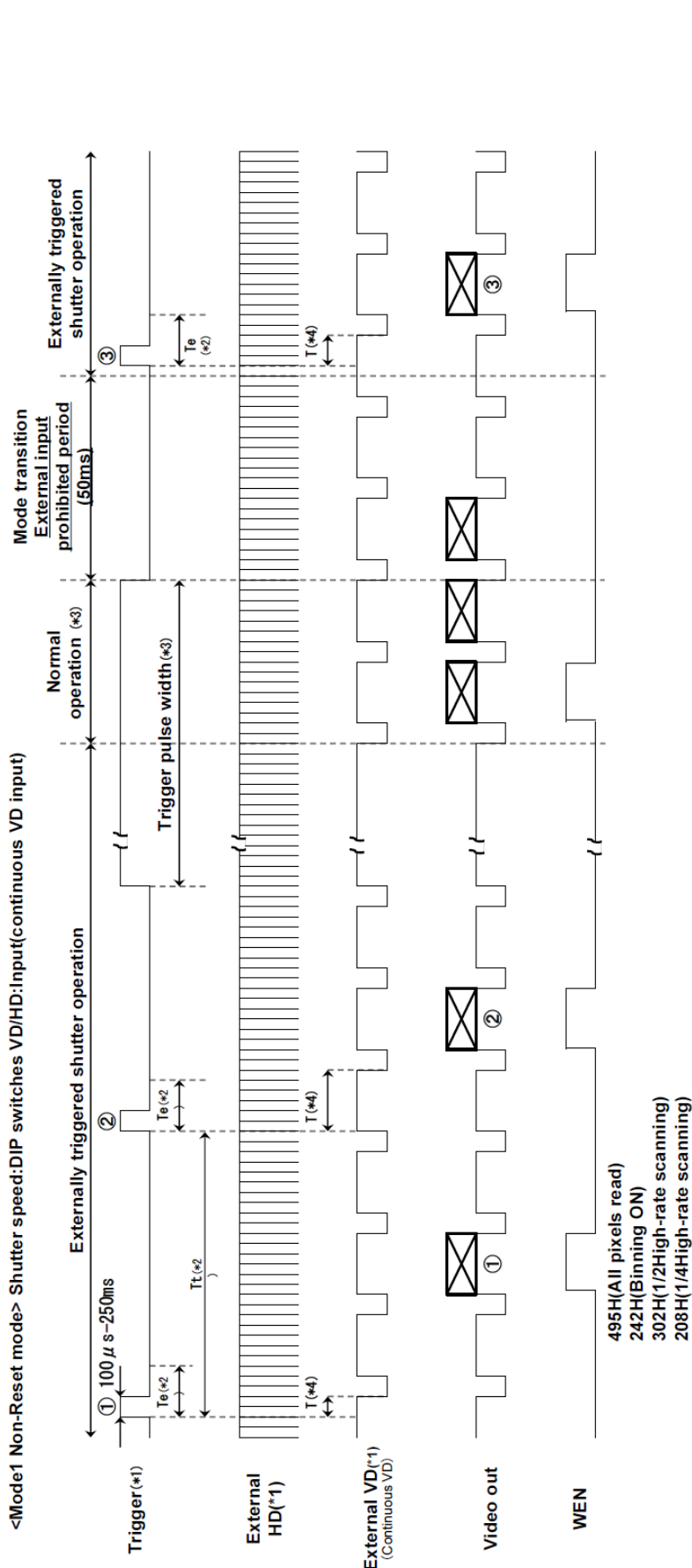
8.1. Restart Reset mode



*1 A signal input from an external device.

*2 Shutter speed T_e
Shortest period: 1V+5H

8.2.1.2. Shutter speed:VD/HD:DIP switch, VD/HD:Input (continuous input)



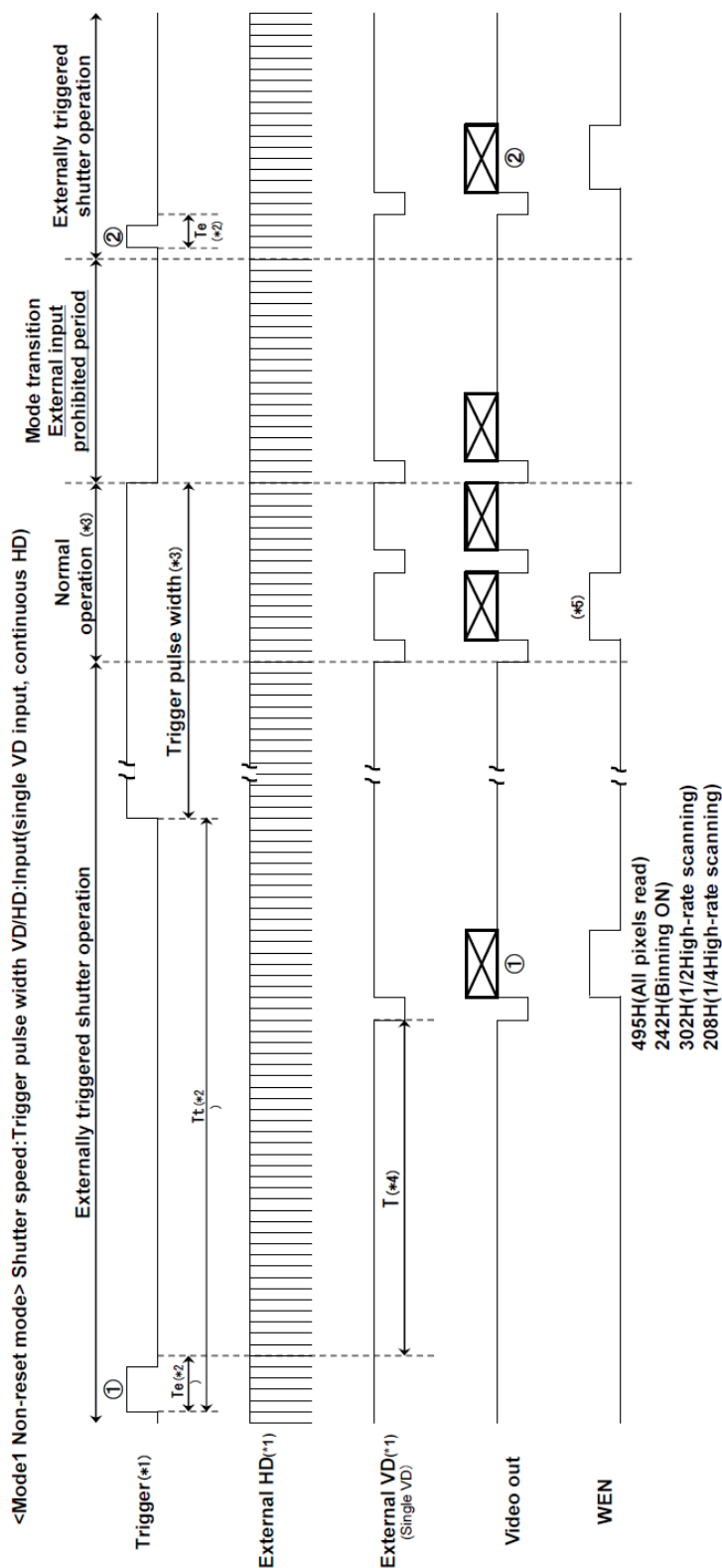
*4 A video is output for the falling of the external VD signal 20 ms or more after the rising of the trigger. ([2] and [3] in the figure) If the period (T in the figure) from the rising of the trigger to the falling of the external VD signal is less than 20 ms, the output is undefined, that is, a video is output for the latest falling or the next falling of the external VD signal. (In the above case, the video for the next external VD signal is output.)
 In the above case, see WEN because it has a one-to-one relationship with the video.

*5 After the externally triggered shutter operation has changed to a normal operation,

Caution

If the next trigger is input before the video output corresponding to the current trigger has finished, the video is affected.

8.2.1.3. Shutter speed: Trigger pulse width, VD/HD: Input(single input)



*1 A signal input from an external device. Always input VD and HD signals together. Input the phase of the VD signal at the rising of the HD signal.

*2 Shutter speed T_e / Trigger period T_t

T_e = Trigger pulse width + 5 μ sec

(The trigger pulse width valid for an externally triggered shutter operation is 2 μ s to 1/4 s.)

Shortest trigger period: T_t = Trigger pulse width + 5 μ s + VD wait time + 1V + 2H

*3 Setting the trigger pulse width to 1/3 s or more returns to a normal operation. Externally triggered shutter operation resumes upon the falling of the trigger. An input from an external device is prohibited for 1V ms after the falling. Therefore, operations related to a trigger input during this period cannot be guaranteed.

*4 Always input an external VD signal 10 μ s to 65 ms after the falling of the trigger.

([1] and [2] in the figure)

Operations after inputs under conditions other than the above cannot be guaranteed. Should a value outside the standard range be input, input the signals according to the specified conditions. Normal operation resumes after a few Vs.

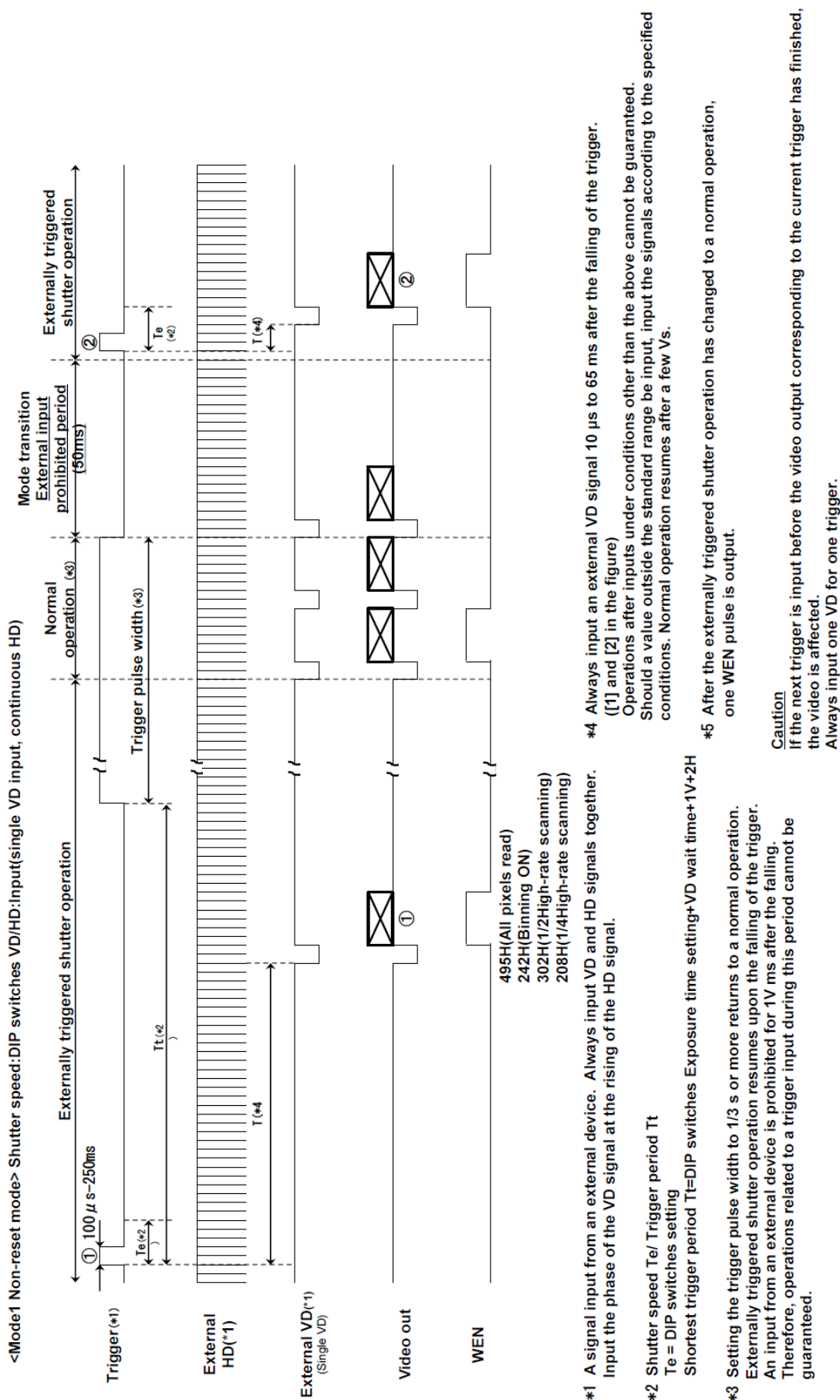
*5 After the externally triggered shutter operation has changed to a normal operation, one WEN pulse is output.

Caution

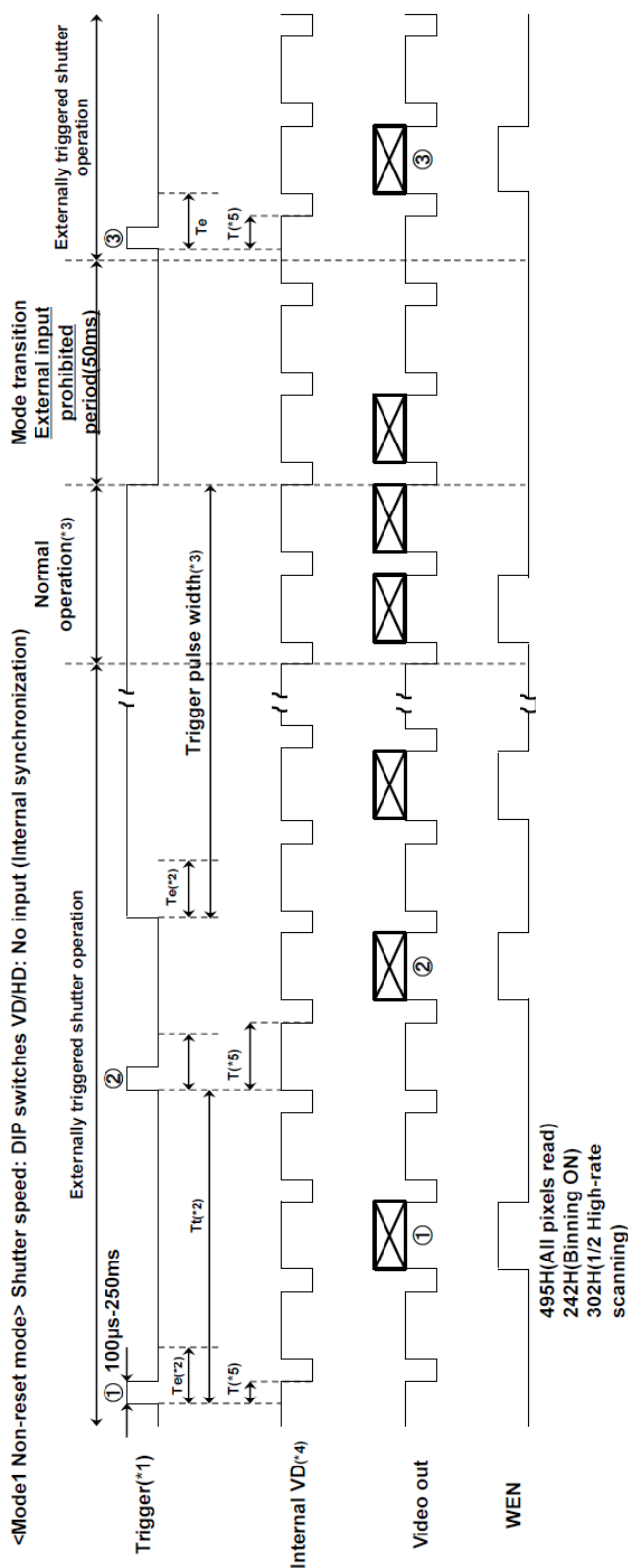
If the next trigger is input before the video output corresponding to the current trigger has finished, the video is affected.

Always input one VD for one trigger.

8.2.1.4. Shutter speed:DIP switch, VD/HD:Input(single input)



8.2.1.6. Shutter speed:DIP switch, VD/HD:No input



*1 A signal input from an external device.

*2 Shutter speed T_t / Trigger period T_t

T_e = DIP switches setting

Shortest trigger period T_t = DIP switches Exposure time setting + VD wait time + $1V + 2H$

*3 Setting the trigger pulse width to 1/3 s or more returns to a normal operation. Externally triggered shutter operation resumes upon the falling of the trigger. An input from an external device is prohibited for 1V ms after the falling. Therefore, operations related to a trigger input during this period cannot be guaranteed.

*4 Internal VD is output by setting the VD/HD signal input/output toggle switch on the rear panel to the INT side, only when an input from an external device is disabled.

*5 A video is output for the falling of the external VD signal 20 ms or more after the rising of the trigger. ([2] and [3] in the figure) If the period (T in the figure) from the rising of the trigger to the falling of the internal VD signal is less than 20 ms, the output is undefined, that is, a video is output for the latest falling or the next falling of the internal VD signal. (In the above case, the video for the next internal VD signal is output.) In the above case, see WEN because it has a one-to-one relationship with the video.

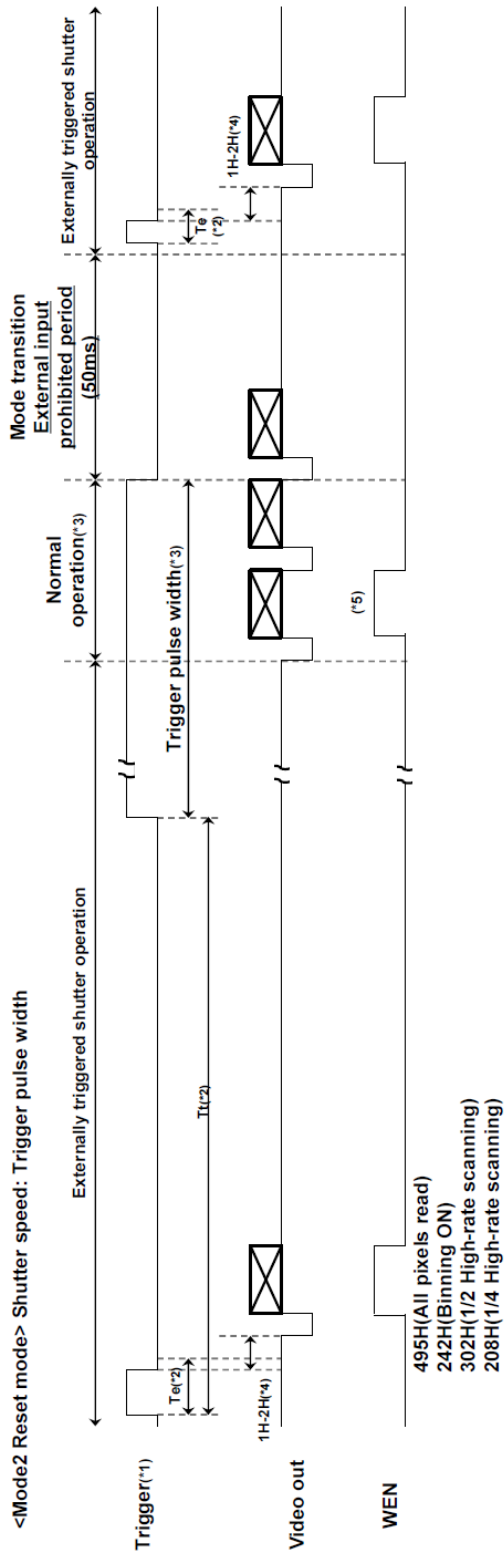
*6 After the externally triggered shutter operation has changed to a normal operation, one WEN pulse is output.

Caution

If the next trigger is input before the video output corresponding to the current trigger has finished, the video is affected.

8.2.2. Mode2 Reset mode

8.2.2.1. Shutter speed: Trigger pulse width



*1 A signal input from an external device

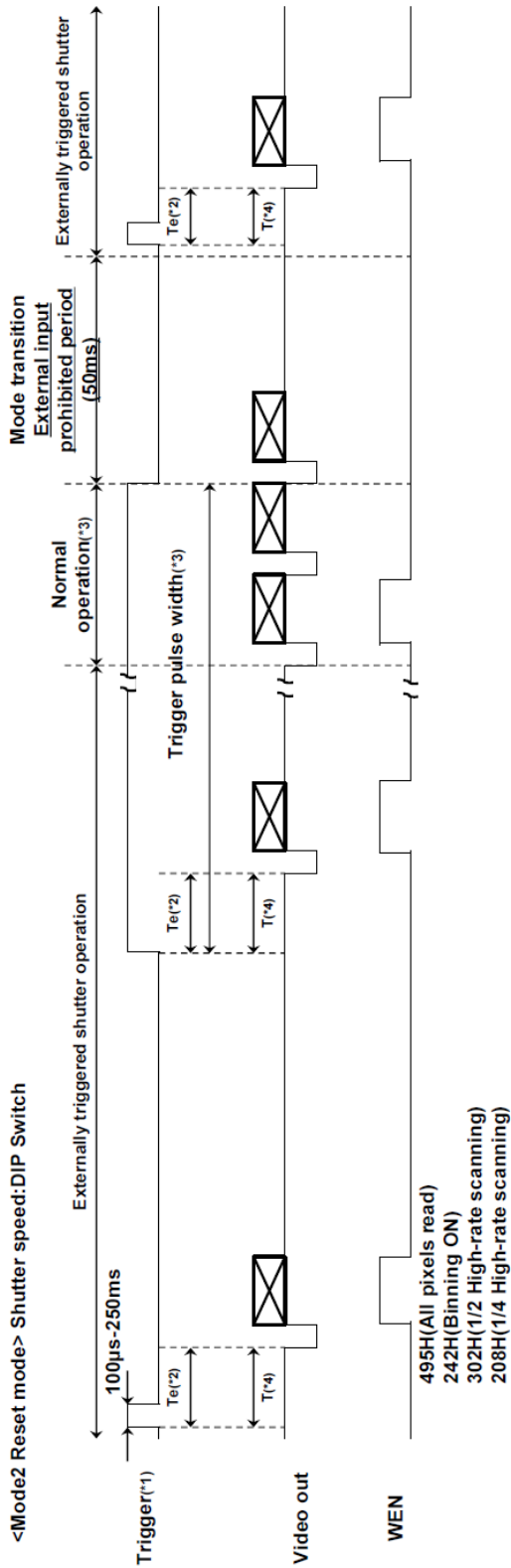
*4 A VD signal is generated 1H to 2H after the falling of the trigger and a video is output in synchronization.

*2 Shutter speed T_e / Trigger period T_t
 $T_e = \text{Trigger pulse width} + 5 \mu\text{sec}$
 (The trigger pulse width valid for an externally triggered shutter operation is $2 \mu\text{s}$ to $1/4 \text{ s}$.)
 Shortest trigger period: $T_t = 1V + 5H$

*5 After the externally triggered shutter operation has changed to a normal operation, one WEN pulse is output.

*3 Setting the trigger pulse width to $1/3 \text{ s}$ or more returns to a normal operation.
 Externally triggered shutter operation resumes upon the falling of the trigger.
 An input from an external device is prohibited for $1V \text{ ms}$ after the falling.
 Therefore, operations related to a trigger input during this period cannot be

8.2.2.2. Shutter speed: DIP switch



*1 A signal input from an external device

*2 Shutter speed T_e / Trigger period T_t
 T_e = DIP switch setting
Shortest trigger period: $T_t = 1V + 5H$

*3 Setting the trigger pulse width to 1/3 s or more returns to a normal operation.
Externally triggered shutter operation resumes upon the falling of the trigger.
An input from an external device is prohibited for 50 ms after the falling.
Therefore, operations related to a trigger input during this period cannot be guaranteed.

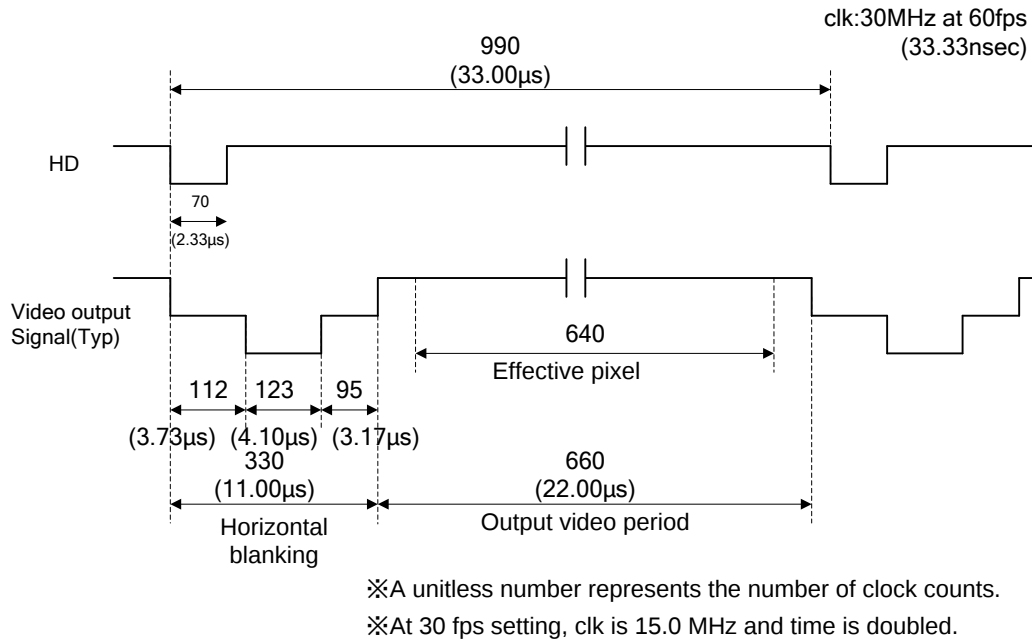
*4 A video is output at the shortest timing after the trigger, according to the setting of the DIP switches.

*5 After the externally triggered shutter operation has changed to a normal operation, one WEN pulse is output.

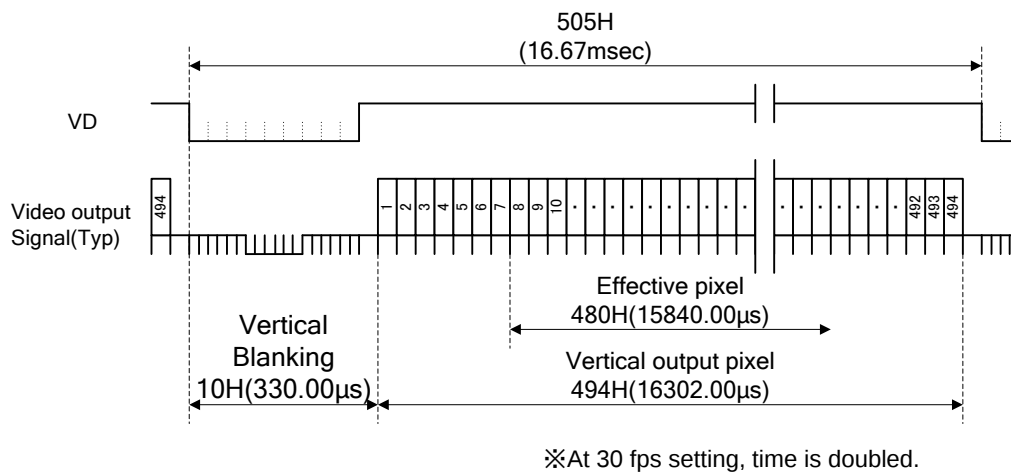
9. Video Output Timing Chart

9.1. All Pixels Readout Timing Chart

The horizontal timing chart at 60 fps setting is shown below.

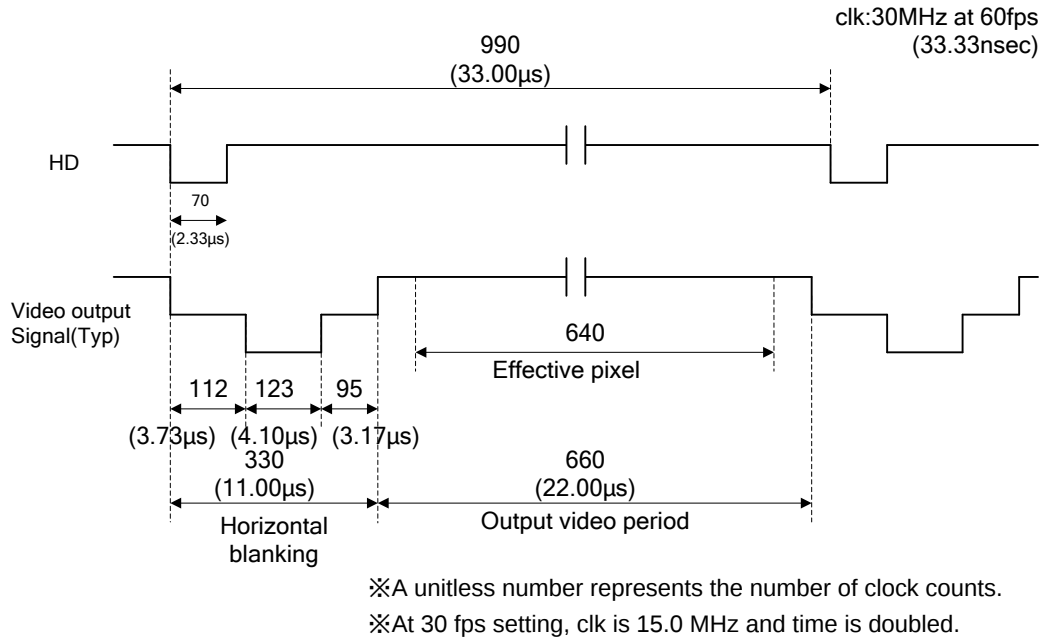


The vertical timing chart at 60 fps setting is shown below.

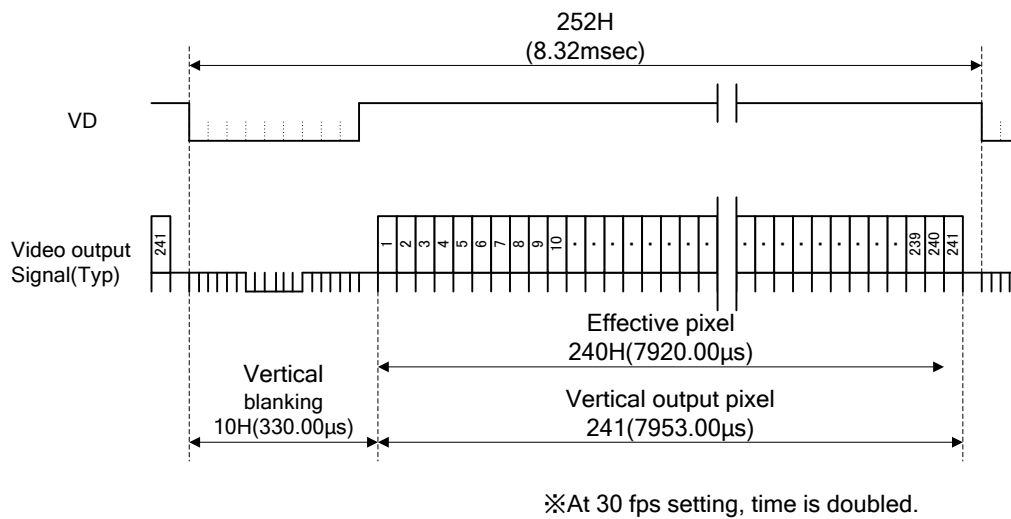


9.2. Binning Readout Timing Chart

The horizontal timing chart at 60 fps setting is shown below.

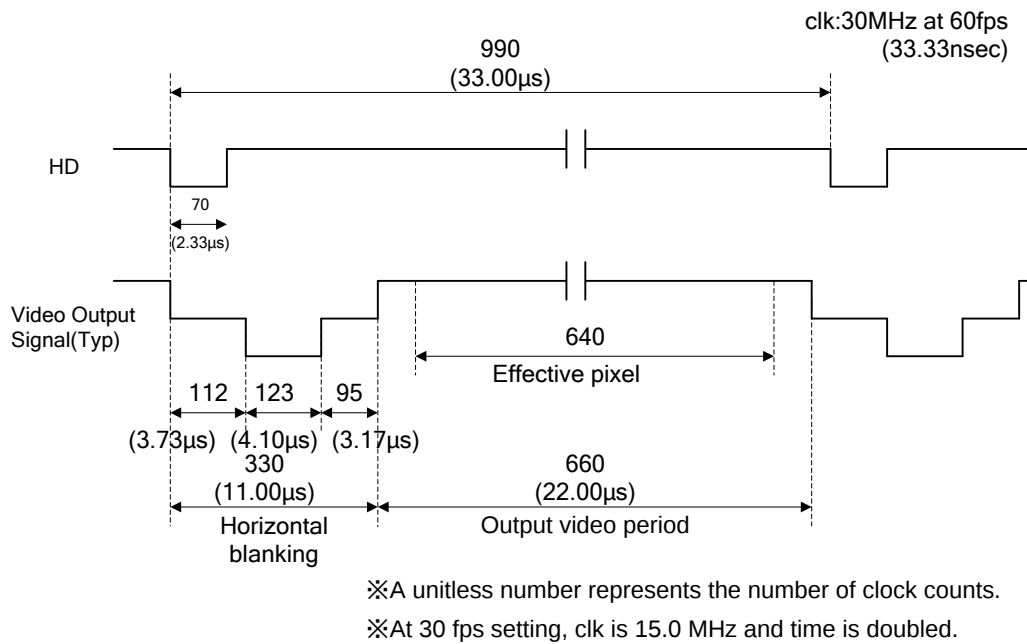


The vertical timing chart at 60 fps setting is shown below.

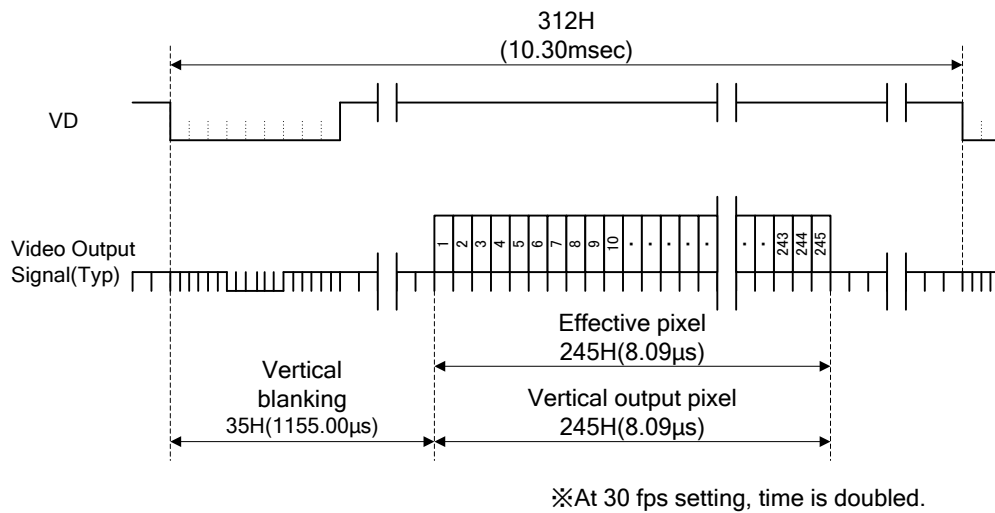


9.3. 1/2 High-rate Scanning Readout Timing Chart.

The horizontal timing chart at 60 fps setting is shown below.

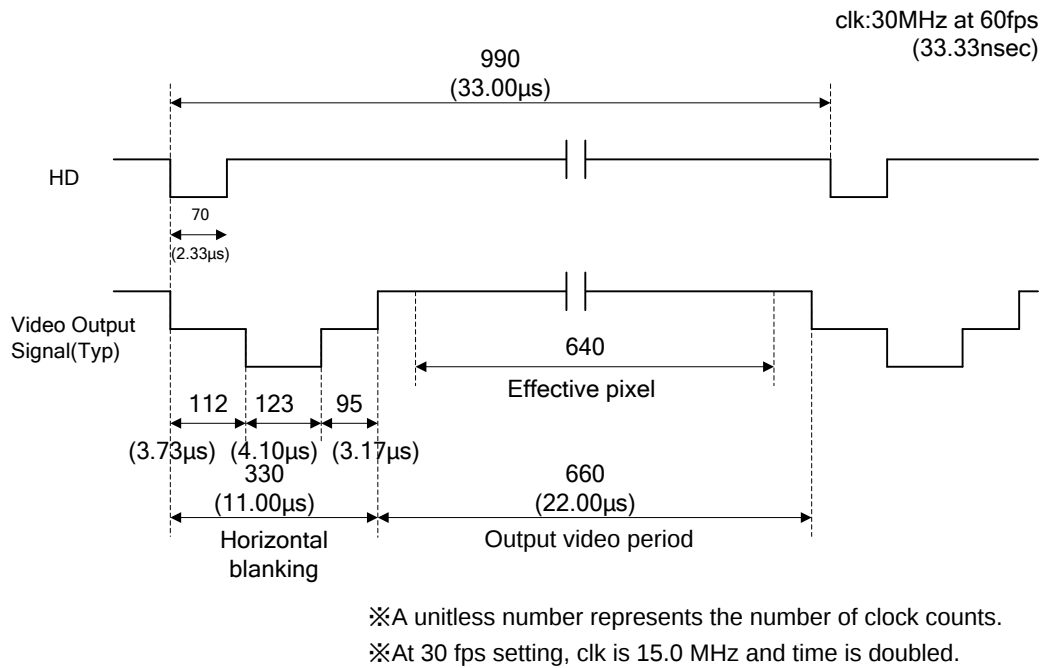


The vertical timing chart at 60 fps setting is shown below.

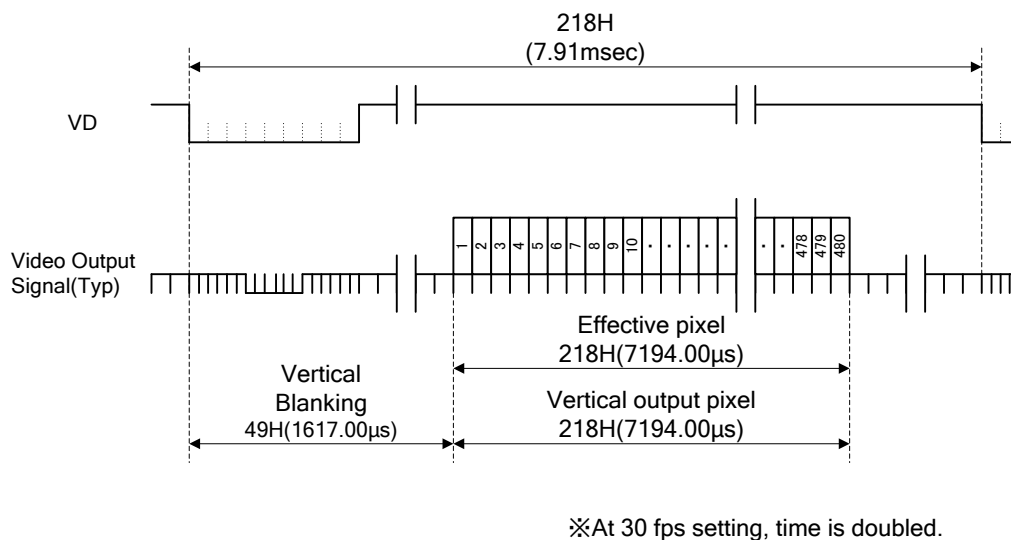


9.4. 1/4 High-Rate scanning Readout Timing Chart.

The horizontal timing chart at 60 fps setting is shown below.



The vertical timing chart at 60 fps setting is shown below.

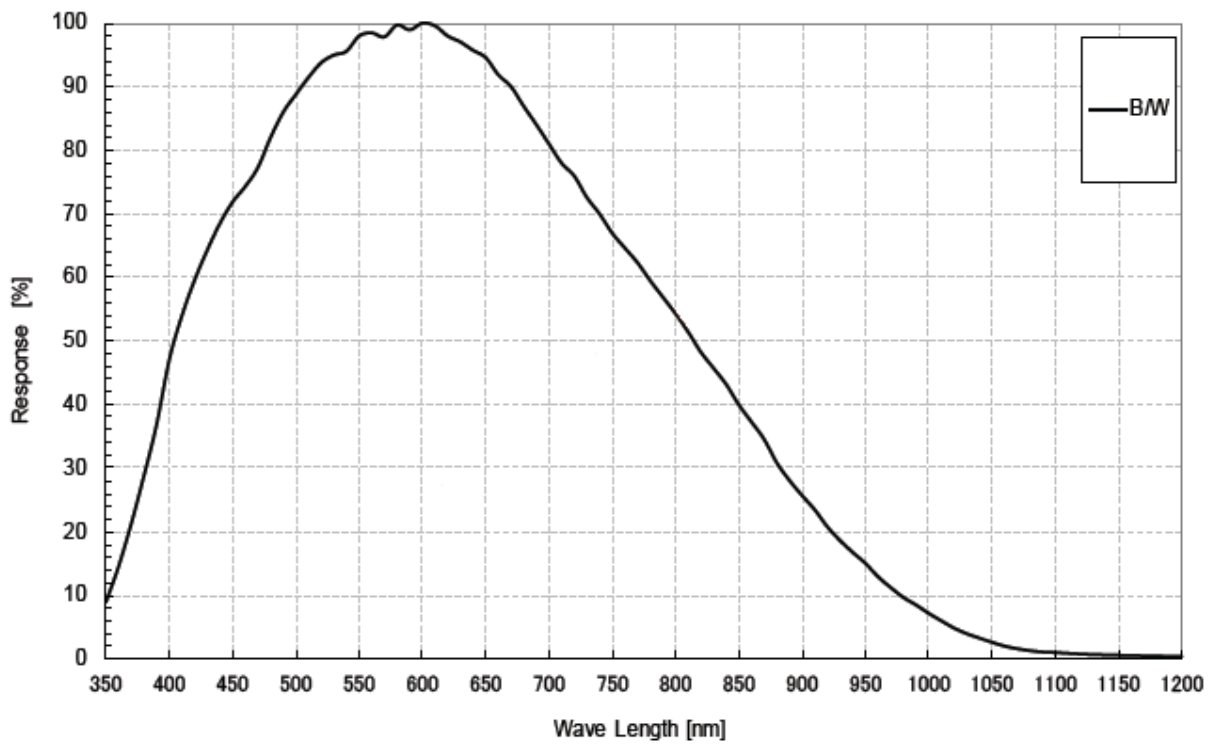


10. Specifications

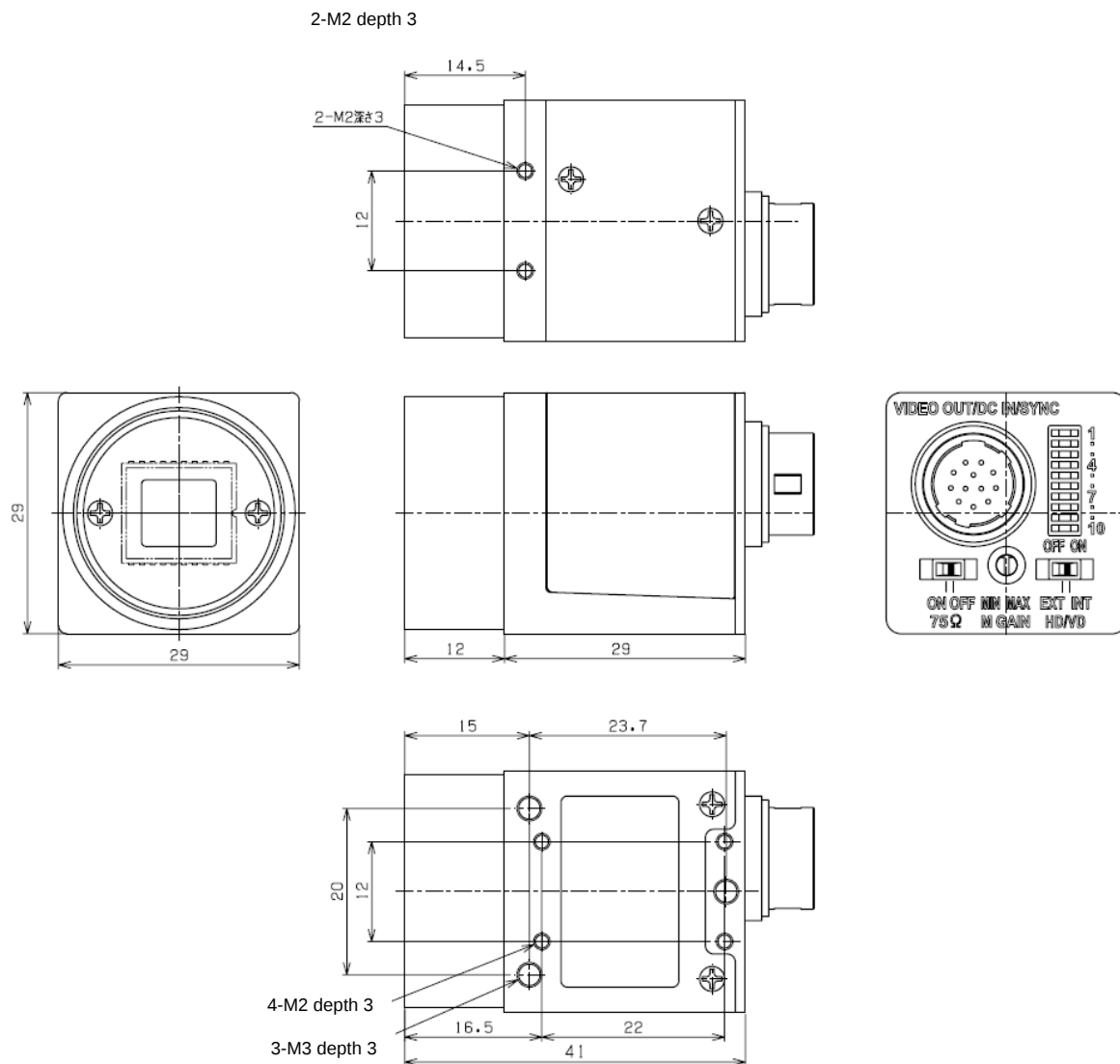
Pickup device	Interline transfer 1/3 type CCD
Effective picture elements	640 × 480 (horizontal/vertical)
CCD vertical driving frequency	30.303kHz (at 60fps) / 15.151kHz(at 30fps)
CCD horizontal driving frequency	30.0000MHz(at 60fps) / 15.0000MHz(at 30fps)
Signaling	—
Cell size	7.4 × 7.4 μm (horizontal/vertical)
Lens mount	C-mount
Flange focus	17.526 ±0.05 mm
Synchronization	External synchronization / Internal synchronization
External synchronization input/output	VD/HD (1 Vp-p)
Allowable external synchronization frequency deviation	±1% (of horizontal synchronization frequency)
Jitter	±50 ns or less
Scanning method	Non-interlace
Sensitivity	400 lx (F5.6, shutter:OFF, Manual gain:Min)
S/N ratio	58dB
Minimum illumination	1 lx (with the manual gain control at maximum, F1.4)
Gain	MGC / FIX
Gamma correction	—
Shutter function	External trigger shutter
Shutter speed	External trigger shutter: 2 μs to 1/4 s
Power	DC +12V
Power consumption	Approx. 1.45 W
Operating temperature	−5 to +45°C
Operating relative humidity	20 to 80% (no condensation)
Storage temperature	−30 to +60°C
Storage relative humidity	20 to 95% (no condensation)
Vibration resistance	10 G (20 Hz to 200 Hz)
Shock resistance	70 G
External dimensions	W 29 mm × H 29 mm × D 29 mm (connectors excluded)
Weight	Approx. 48 g
Standards	CE, FCC
Accessories	Lens mount cap (1), Operation Manual (1)

Specifications and design are subject to change without notice.

10.1. Relative spectral sensitivity characteristics



11. External Dimensions



Units: mm

The content of this manual is subject to change without notice.

Technical materials and data in this manual are only for reference of actual use. Nothing contained herein shall be construed as granting the rights to practice or use the intellectual properties of our company or any other third party.

Thus we assume no responsibility whatsoever for any violation resulting from such use.

Contact:

Primetech Engineering Corp.
1-3-25, Koishikawa, Bunkyo-ku,
Tokyo 112-0002
Tel. 03-5805-6766
Fax. 03-5805-6767
URL: <http://www.pte.jp>
Mail: sales@pte.co.jp