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Find the *Sony XC-7500* at our website: ***Click HERE***

SONY

Progressive Scan B/W CCD Camera Module

XC-7500
XC-8500CE
CMA-87

Component/OEM



XC-7500
1/2" IT CCD
659(H) X 494(V), EIA

XC-8500CE
1/2" IT CCD
782(H) X 582(V), CCIR

CMA-87

OUTLINE

The XC-7500/XC-8500CE is a frame shutter camera that mounts a newly developed CCD. Square grid cells most suitable for a machine vision are used for this CCD that enables all pixels to be read. The resolution is equal in the vertical and horizontal directions. Therefore, it is not required to correct the dimension on the image processing side. The XC-7500 conforms to an EIA system of 659(H) x 494(V), and the XC-8500CE conforms to a higher-resolution CCIR system of 782(H) x 582(V). The XC-7500 and XC-8500CE enable a trigger frame shutter (E-DONPISHA) control function, signal format conversion function, and high-rate scanning function when they are connected with an optional memory adaptor (CMA-87). Moreover, the still pictures of various high-speed movable objects can be read at a high resolution (in the horizontal and vertical directions).

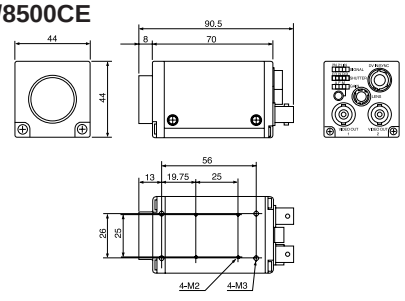
FEATURES

XC-7500/XC-8500CE
- 1/2"Hyper HAD IT CCD
- Square Pixels 9.9 x 9.9µm(XC-7500), 8.3 x 8.3µm(XC-8500CE)
- Frame Shutter
  Normal : 1/60~1/10,000sec, 1/50~1/10,000sec, Flickerless
  E-DONPISHA :
    Low-Speed : ∞~approx.1/60sec, ∞~approx.1/50sec
    Normal-Speed : 1/1,000~1/11,000sec, 1/1,000~1/10,000sec
    High-Speed : 1/10,000~1/100,000sec
    External Control : ∞~1/60~1/10,000sec, ∞~1/50~1/10,000sec
- Three Mode Outputs
    Interlace(1/60sec, 1/50sec)-2I mode
    Non interlace(1/60sec, 1/50sec)-2Nmode
    Non interlace(1/30sec, 1/25sec)-1N mode
- Restart Reset Function (Trigger Input)

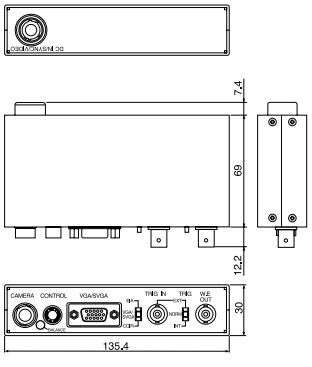
CMA-87
- E-DONPISHA(Frame Shutter)Control
- Signal format conversion EIA/CCIR, VGA/SVGA
- High-Rate scan-Up to 4

DIMENSIONS

XC-7500/8500CE

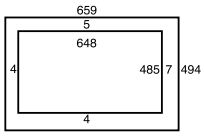


CMA-87



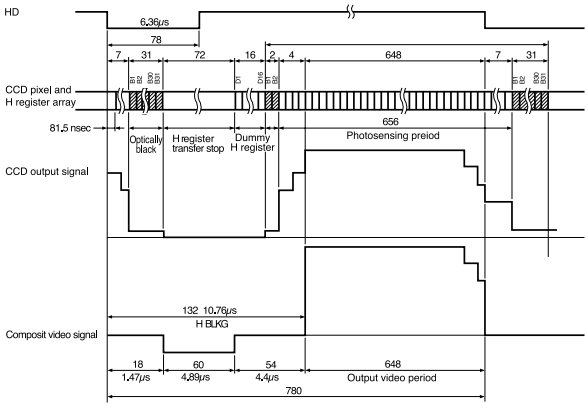
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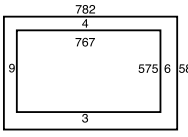
CCD OUTPUT WAVE TIMING CHART



●XC-7500

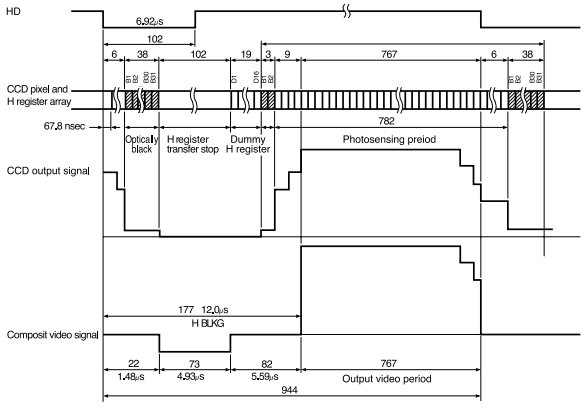
- •Optical size:1/2-inch format
- •Total number of pixels:692(H)x504(V)
- •Efective picture elements:659(H)x494(V)
- •Number of video output pixels:648(H)x485(V)
- •Unit cell size:9.9µm(H)x9.9µm(V)





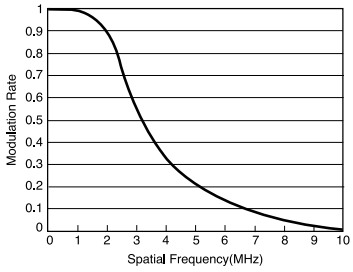
●XC-8500CE

- •Optical size:1/2-inch format
- •Total number of pixels:823(Hx592(V)
- •Efective picture elements:782(H)x582(V)
- •Number of video output pixels:767(H)x575(V)
- •Unit cell size:8.3µm(H)x8.3µm(V)

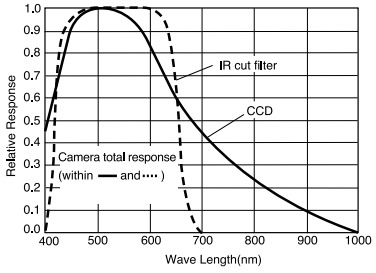


MTF,SPECTRAL RESPONSE

●MTF

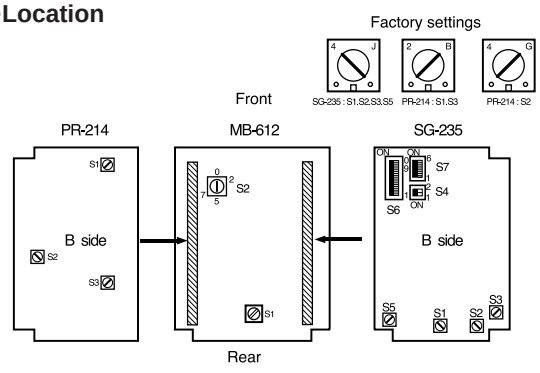


●Spectral Response



INTERNAL SWITCH FUNCTIONS

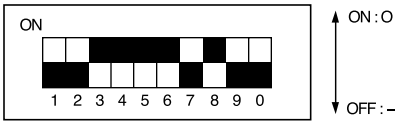
●Location



Location	No.	Function	Factory Setting
MB-612	S1	High-Rate ON/OFF	OFF
	S2	Normal Shutter 0:1/60 1:1/125 2:1/250 3:1/500 4:1/1000 5:1/2000 6:1/4000 7:1/10000 8:FL 9:FL	0
SG-235	S1	VD 75Ω termination ON/OFF	ON
	S2	INT H/V OUT / EXT H/V IN	EXT H/V IN
	S3	HD 75Ω termination ON/OFF	ON
	S4	R.Rmode VDpulse 1~4	1:OFF 2:OFF
	S5	Trigger polarity +/-	+
	S6	E-DONPISHA®Shutter Speed	approx1/1000sec
	S7	E-DONPISHA®WE(0V/-1V)	1:OFF(-1v)
		VIDEO(3V/1V)	2:OFF(1v)
		RESET/NON RST	3:OFF(NON)
		WE +/-	4:OFF(–)
		HIGH SPEED	5:OFF
		LOW SPEED	6:OFF
PR-214	S1	VIDEO 1 r ON/OFF	OFF
	S2	Gain tracking MAN/AUTO	MAN
	S3	VIDEO 2 r ON/OFF	OFF

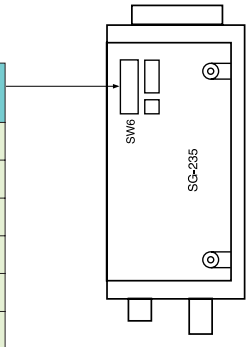
E-DONPISHA®

●Set the E-DONPISHA switch on SG-235 board



XC-7500

Shutter speed (sec)	SW6 1	2	3	4	5	6	7	8	9	0
1/1000	ON	ON					ON		ON	ON
1/2000	ON	ON				ON	ON		ON	
1/3000		ON							ON	
1/4000		ON			ON	ON	ON			
1/6000		ON								
1/8000	ON	ON	ON			ON				
1/10000	ON			ON	ON					
1/11000			ON		ON					



XC-8500CE

Shutter speed (sec)	SW6 1	2	3	4	5	6	7	8	9	0
1/1000					ON				ON	ON
1/2000	ON	ON	ON				ON		ON	
1/3000		ON			ON			ON		
1/4000	ON		ON			ON	ON			
1/6000	ON	ON	ON		ON	ON				
1/8000			ON			ON				
1/10000		ON	ON		ON					

E-DONPISHA®

This function accumulates electric charges with the external input trigger pulse as reference, places them on a continuous sync signal, and outputs a video signal. The objects that move at high speed are recognized using a sensor, and the image can be precisely shot in the fixed place. Normal speed (shown in the figure on the left), low speed, high speed, and external control speed are available as the shutter speed. The shutter operates in the range of ∞ to 1/100,000 sec.

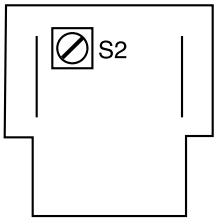
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VARIOUS SHUTTER FUNCTIONS

NORMAL SHUTTER(N.s.)

This shutter speed is used when a continuous picture without blurring is required.

Rotary Switch
MB-612 board

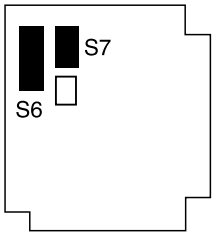


Position	Shutter Speed(sec)	Position	Shutter Speed(sec)
0	OFF	5	1/2000
1	1/125	6	1/4000
2	1/250	7	1/10000
3	1/500	8	FL(Flickerless)
4	1/1000	9	FL(Flickerless)

E-DONPISHA®

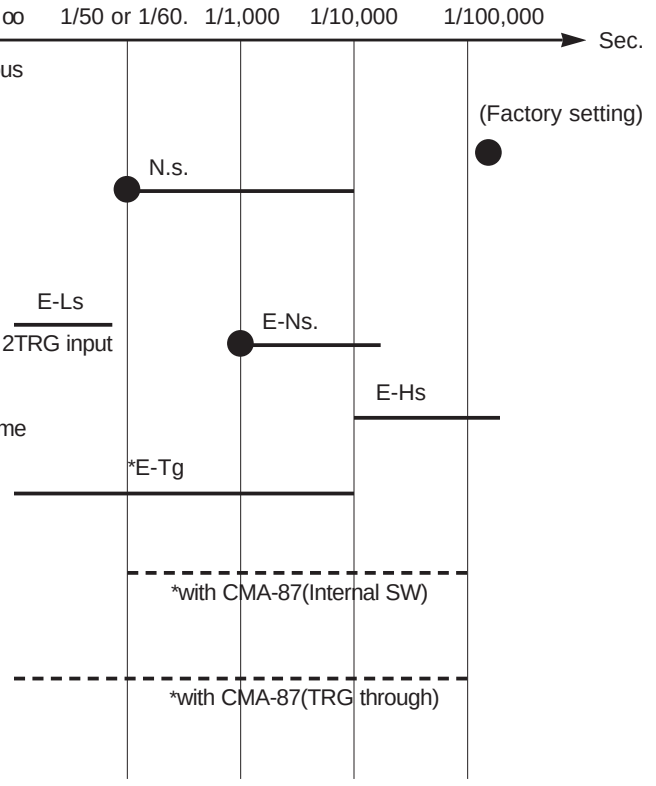
This shutter speed is used to obtain one frame of still picture by inputting any trigger pulse.

SG-235 board



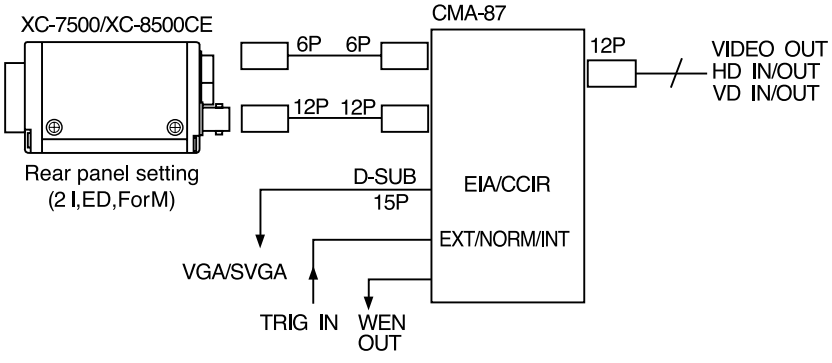
S6 : Setting Shutter Speed
S7 : Setting E-DONPISHA®

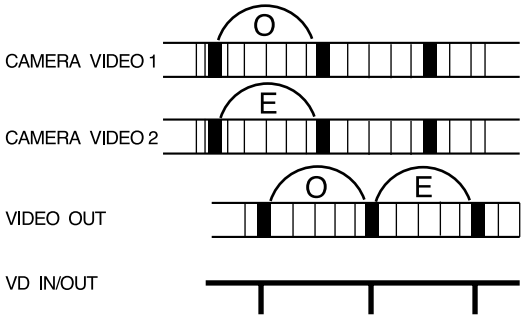
- Low-Speed(E-Ls)
(for long exposure)
- Normal-Speed(E-Ns)
- Extenal Control(E-Tg)
(wide range speed by trigger width control)
- High-Speed(E-Hs)
(for capturing high speed object)



*In case of XC-7500, the connection with CMA-87 and E-Tg mode are available after #500001.

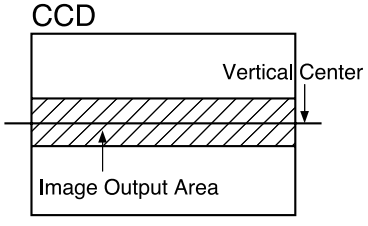
CMA-87





One-Shot Memory of E-DONPISHA®

This function controls the E-DONPISHA frame shutter by inputting a trigger pulse and memorizes the simultaneous timing signal output from the VIDEO OUT 1 and 2 terminals of the camera.



High-Rate Scanning

The image in a CCD can be read partially (in the vertical center portion) at high speed. This function is useful in the field where a shorter trigger cycle than one field is required. (1.5, 2, 3, and 4 times the normal speed)

Example)
XC-8500CE: 220/64 lines at 2/4 times the normal speed
XC-7500: 180/48 lines at 2/4 times the normal speed

Sports Mode

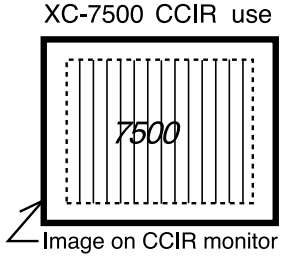
In the sports mode, a continuous picture at two times the normal speed (1/100 sec.) can be read as a 50-field (CCIR/PAL) output by combination with the XC-8500CE. Since 1/100 sec. are precisely required in the sports world, this mode can be used for video recording.

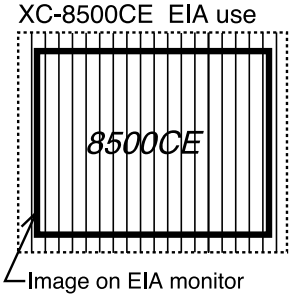
Signal Format Conversion

CMA-87 VIDEO OUT

Output	*7500	8500CE	Scan Convert Out
VGA	OK		646x485 / 60 Frame
SVGA		OK	767x575 / 50 Frame
EIA	OK	OK	646x485 / 30 Frame
CCIR	*OK	OK	767x575 / 25 Frame

*In case of XC-7500,the above function is available after #500001



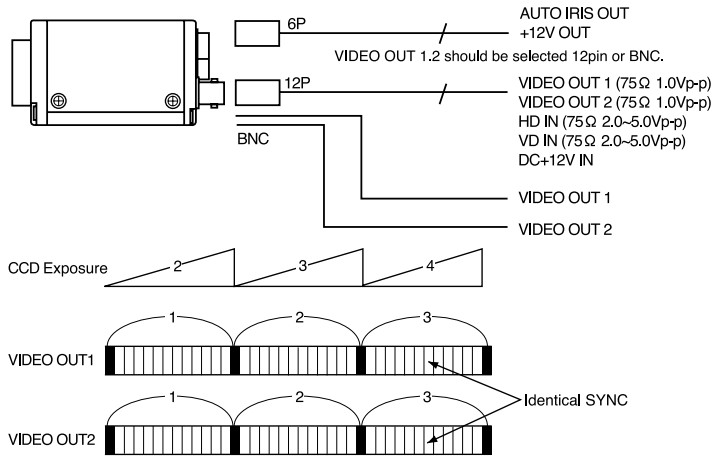


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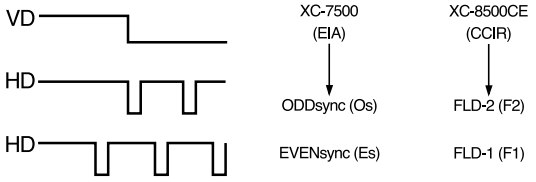
CONDITIONS & TIMING FOR SHUTTER FUNCTION

Normal Mode

The connection for normal operation and normal shutter.



Difinition of Sync Signal



O = ODD field image
E = EVEN field image

Output Image

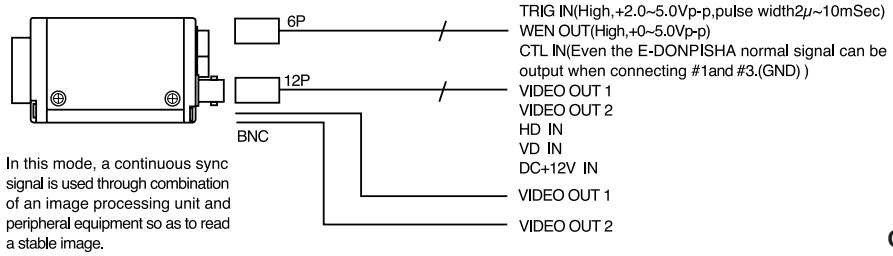
	XC-7500/XC-8500CE		
Output	Continuance image		
Sync	Internal/External		Internal
Output mode	2I	1N	2N
VIDEO OUT 1	O1,E2	O1+E1	E1,E2
VIDEO OUT 2	E1,O2	/	O1,O2

The sync signal at the VIDEO OUT 2 terminal is the same as that at the VIDEO OUT 1 terminal.
In the 2I mode, O1, O2/E1,E2 signals can be continuously output by inputting a non-interlaced external sync signal.

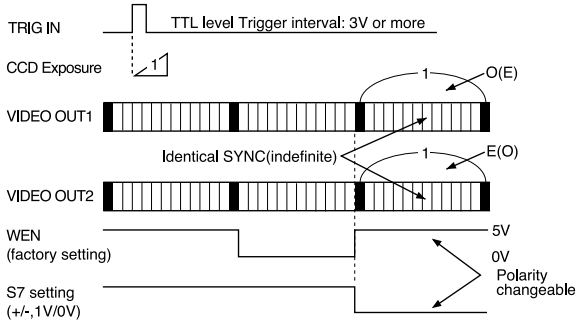
Extarnal Trigger Shutter

The E-DONPISHA mode can capture one shot image by external trigger.

●Non Reset Mode(one shot image/standard sync) (S7:Factory setting)



In this mode, a continuous sync signal is used through combination of an image processing unit and peripheral equipment so as to read a stable image.



Shutter Range
- ●Low-Speed
- ●Normal-Speed
- ●High-Speed
- ●External Control

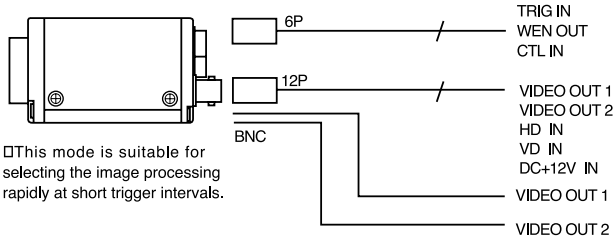
Output Image

( ):XC-8500CE

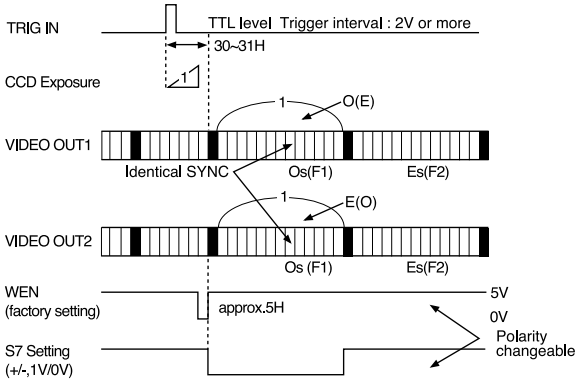
	XC-7500/XC-8500CE		
Output	One shot image		
Sync	Internal/External		
Output mode	2I	1N	2N
VIDEO OUT 1	O(E)	O+E	/
VIDEO OUT 2	E(O)	/	/

In the 2N mode, the VIDEO OUT 1 and 2 terminals do not operate.
The sync signal at the VIDEO OUT 2 terminal is the same as that at the VIDEO OUT 1 terminal.

●Reset Mode(one shot image/non standard sync)



This mode is suitable for selecting the image processing rapidly at short trigger intervals.



Write Enable Pulse (WEN)

In a camera, the write enable pulse is output 1V before a video output signal is produced or it is output simultaneously with a video output signal. This pulse is used for combination with peripheral equipment.

Shutter Range
- ●Low-Speed
- ●Normal-Speed
- ●High-Speed
- ●External Control

Output Image

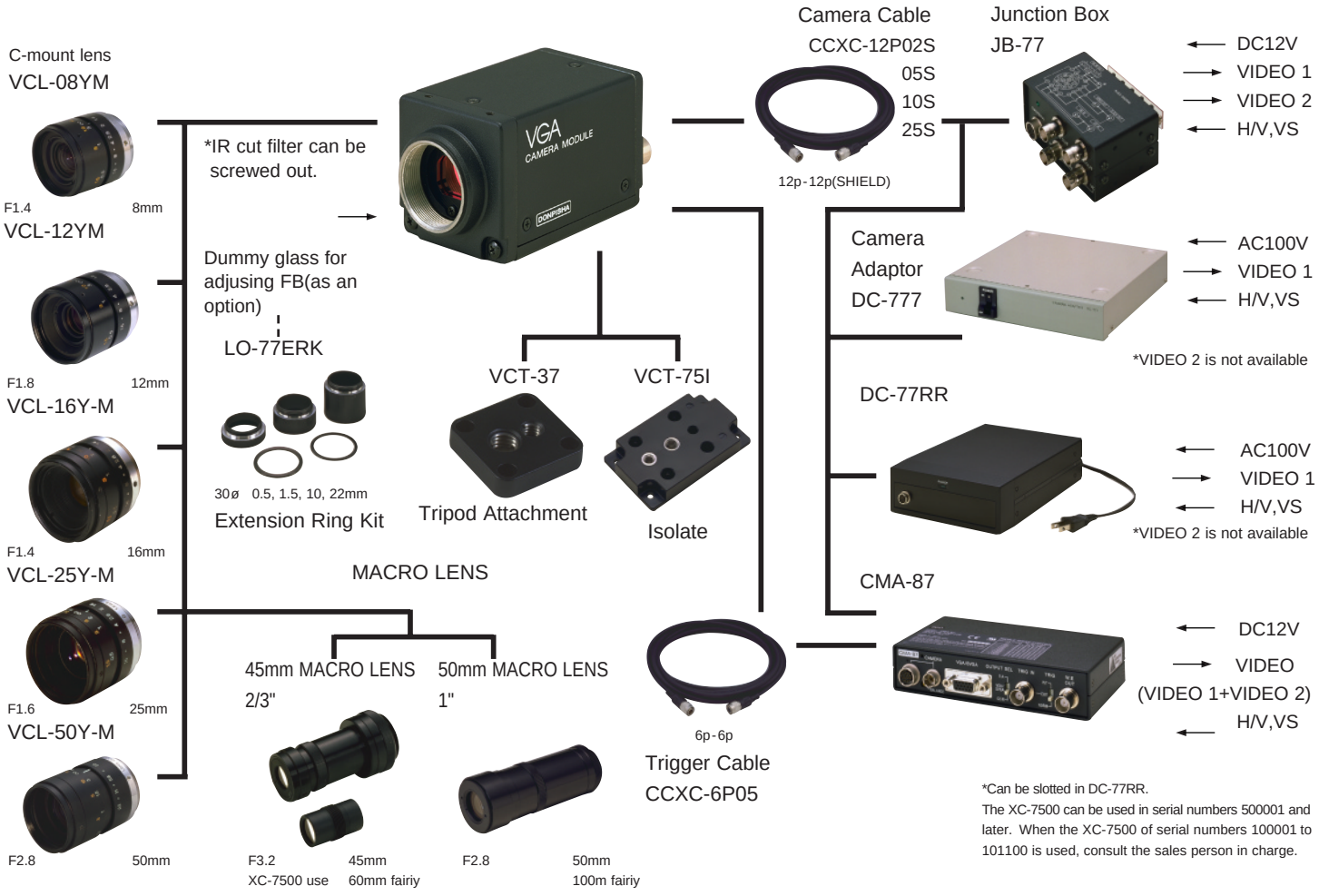
( ):XC-8500CE

	XC-7500/XC-8500CE		
Output	One shot image		
Sync	Internal		
Output mode	2I	1N	2N
VIDEO OUT 1	O(E)	/	/
VIDEO OUT 2	E(O)	/	/

In the 1N and 2N modes, the VIDEO OUT 1 and 2 terminals do not operate.
The sync signal at the VIDEO OUT 2 terminal is the same as that at the VIDEO OUT 1 terminal.

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CONNECTIONS



*Can be slotted in DC-77RR.
The XC-7500 can be used in serial numbers 500001 and later. When the XC-7500 of serial numbers 100001 to 101100 is used, consult the sales person in charge.

REAR SWITCHES & CONNECTORS

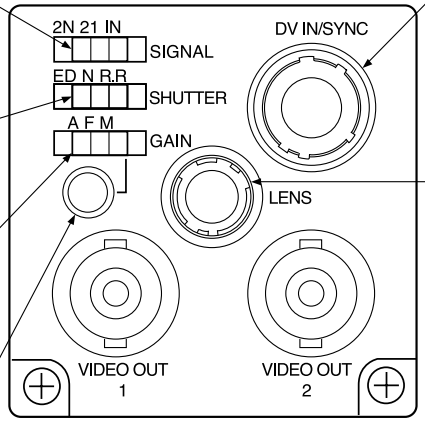
12P MULTI							
Pin No.	EXTERNAL SYNC MODE		INTERNAL SYNC MODE	Pin No.	EXTERNAL SYNC MODE		INTERNAL SYNC MODE
	HD/VD	VS			HD/VD	VS	
1	GND	GND	GND	7	VD IN	VS IN	VD OUT
2	+12V	+12V	+12V	8	VIDEO(G)	VIDEO(G)	VIDEO(G)
3	VIDEO(G)	VIDEO(G)	VIDEO(G)	9	VIDEO OUT2	VIDEO2	VIDEO OUT2
4	VIDEO OUT1	VIDEO1	VIDEO OUT1	10	GND	GND	GND
5	HD(G)		HD(G)	11	+12V	+12V	+12V
6	HD IN		HD OUT	12	VD(G)	VS(G)	CD(G)

	VIDEO OUT MODE
2N	1/60S NON INTER
2I	1/60S INTERLACE
IN	1/30S NON INTER

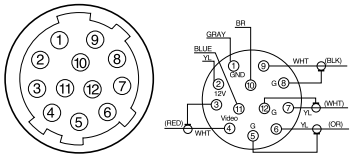
	SHUTTER MODE
ED	E-DONPISHA
N	NORMAL
R.R	RESTART RESET

	GAIN MODE
A	AUTO GAIN
F	FIX GAIN
M	MANUAL GAIN

MANUAL GAIN CONTROL VOLUME



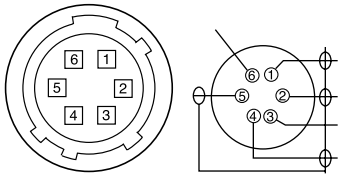
12Pin Connector



6P MULTI	
Pin No.	SIGNAL
1	CTL IN/FLD OUT
2	TRIGGER IN
3	GND
4	WE OUT
5	AI VIDEO OUT
6	+12V OUT

*

6Pin Connector



CTL IN/FLD OUT

*CTL IN is very useful for monitoring the normal image during E-DONPISHA.Serial numbers 100201 and later are set to CTL IN at the factory.Therefore, a video signal is usually output when pin 1 is connected to ground (GND) during E-DONPISHA setting. In the XC-7500, serial numbers 100001 to 100200 are set to FLD OUT at the factory.To set serial numbers 100201 and later to FLD OUT, the XC-7500 must be changed internally.

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COMPARISON WITH SONY XC-711

		XC-003/P	XC-711/P
Pick up device		1/3"Hyper HAD IT CCD	2/3"HAD IT CCD
Sensing system		3CCD prism block(*:1)	1CCD RGB vertical
Lens mount		C mount	C mount
Horizontal resolution	NTSC/PAL	570TV lines/570TV lines	330TV lines/330TV lines
	RGB	756 pixels/739 pixels each	252 pixels/246 pixels each
Vertical resolution		485 lines/575 lines	485 lines/575 lines
RGB sync system		2Vp-p, 75Ω	0.3Vp-p/2Vp-p, 75Ω
Extrenal sync system		HD/VD, VS(*:2)	HD/VD, VS(*:3)
External trigger shutter		E-DONPISHA (*:4) Internal sync Restart Reset(*:4)	External sync Restart Reset
Shutter speed		Normal:1/100~1/10000sec. E-DONPISHA®:1/1000~1/12000sec. PAL~1/10000sec.	Normal:1/125~1/10000sec. PAL:1/60~
Dimensions		50(H) x 56(W) x 128(D)mm	50(H) x 56(W) x 149(D)mm

* : 1. In some lenses, the color shading peculiar to a prism block may occur. Therefore, use an XC-003 lens (VCL-08WM/16WM/25WM) or a lens with a exit pupil distance of more than 100 mm.
2. VBS and Y/C signals are used as a monochromatic video output signal during external synchronization.
3. VBS and Y/C signals are used as a monochromatic video output signal during external synchronization, but they can be color-monitored by changing the internal setting of the camera.
4. The internal sync restart reset mode and E-DONPISHA® reset mode cannot be externally synchronized using an HD/VD signal or VS signal.

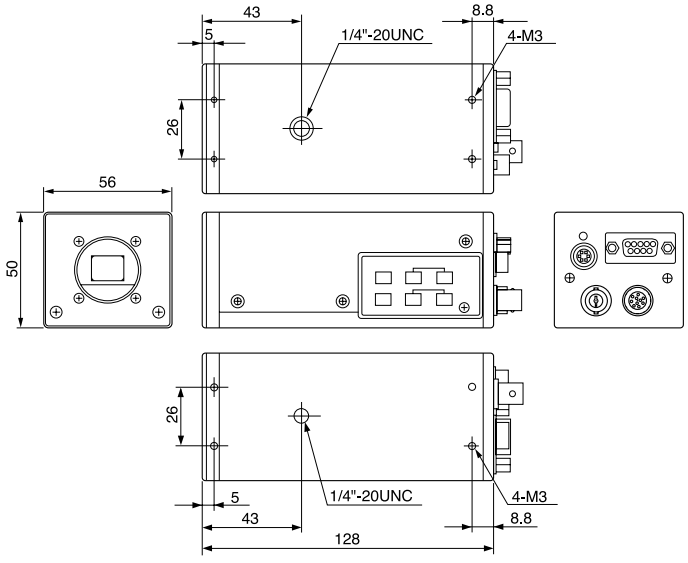
Long-Time Exposure

The long-time exposure up to 128 frames can be carried out at low-speed shutter mode at on-screen menu. The XC-003/003P automatically calculates the integration time corresponding to the frame numbers on the menu,and outputs continued frame images.
The long-time exposure also can be available with Restart Reset function. For this function,2 trigger pulses are required;one for starting the integration, the other for ending it. Field or frame output is available by Restart Reset mode setting.

SPECIFICATIONS

	XC-003	XC-003P
Signal system	NTSC	PAL
Pick up device	1/3" Hyper HAD Interline Trasfer CCD(x3)	
Picture elements	768(H) x 494(V)	752(H) x 582(V)
Video output elemens	756(H) x 485(V)	739(H) x 575(V)
Cell size	6.35(H) x 7.4(V)µm	6.5(H) x 6.25(V)µm
Lens mount	C mount	
Flange back	17.526mm in air	
Video out	RGB,Y/C(9pin D-Sub), VBS(12pin/BNC), Sync(RGB):2Vp-p, 75Ω	
Horizontal resolution	570TV lines,RGB:756pixels each	570TV lines,RGB:739pixels each
S/N ratio	59dB	58dB
Sensitivity	2000Lux(F5.6)	
Min.sensitivity	31Lux(F2.2, Gain+18dB, video out 100%level)	
Gain	0~18dB(1dB STEP)	
Sync system	Internal/External(auto)	
External sync	HD/VD,VS(Frequency deviation:±1%)	
Shutter speed	Normal shutter:1/100~1/10000sec.(8 steps)	
	Low speed shutter:2~129 frame(1 frame each)	
	E-DONPISHA: 1/1000~1/12000sec.(8 steps)	E-DONPISHA: 1/1000~1/10000sec.(7 steps)
	Restart Reset:1/100~1/10000sec.(8 steps)	
External trigger input	H:4~5Vp-p, L:0~0.7Vp-p, positive polarity, High reseption pulse width:2µ~10msec.	
WEN output	5Vp-p, negative polarity(+/- changeable), High impedance termination	
Power requirements	DC12V(11.0~16.0V)/5.6W	
Dimensions	56(W) x 50(H) x 128(D)mm	
Weight	440g	
Regulations	FCC, UL, CSA, CE	
Operating temperature	-5~+45°C	
Storage temperature	-20~+60°C	
Shock resistance	490m/sec.(50G), 6 directions	
Vibration resistance	29.4m/sec.(3G), 11~200Hz,	
MTBF	19200Hrs(based on MIL-HDBK-217F)	

DIMENSIONS



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