



*High Resolution DSP Color & B/W Camera*

# *CV-S2500 TWIN series*

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## *OPERATION MANUAL*



## **DECLARATION OF CONFORMITY**

AS DEFINED BY THE COUNCIL DIRECTIVE

89/336/EEC  
EMC (ELECTROMAGNETIC COMPATIBILITY)

AND

73/23/EEC  
LVD (LOW VOLTAGE DIRECTIVE)

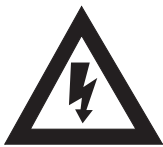
WE HEREWITH DECLARE THAT THIS PRODUCT  
COMPLIES WITH THE FOLLOWING PROVISIONS APPLYING TO IT.

EN-50081-1

EN-50082-1

EN-60065 (1993)

**ENGLISH VERSION**



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.



The slash within a circle is intended to alert the user to the presence of prohibition of any kind of operation, maintenance and storage.



The abstraction within a circle is intended to alert the user to presence of prohibition to disassemble the product.



The abstraction within a circle is intended to alert the user to turn the power off on the product and to take out the plug.



The abstraction within a circle intended alert the user to presence of prohibition to expose the product to rain, moisture or any kind of moist surroundings.

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## Precautions



Do not attempt to disassemble this camera.



To prevent electric shock, do not remove cover. There are no user-serviceable parts inside. Refer servicing to qualified service personnel.



Do not expose this camera to rain or moisture.



Do not face this camera towards the sun, extreme bright light or light reflecting objects.  
Even when this camera is not in use, put the supplied lens cap on the lens mount.



Handle this camera with the maximum care.



Operate this camera only from the type of power source indicated on the camera.



Power-off the camera during any modification such as changes of jumper-line and jumper-register.

### **USER'S RECORD**

The production serial number are shown on the bottom of camera

Model Name :

Serial No. :

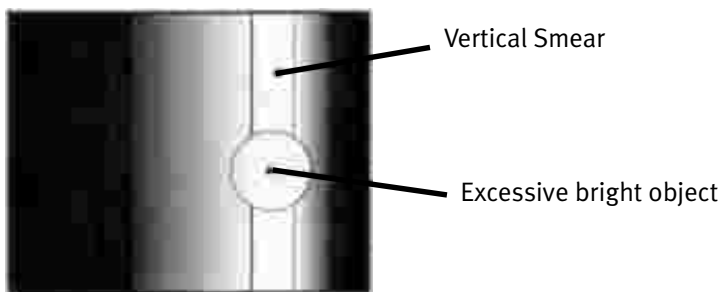
## Typical CCD characteristic

The following effects may be observed on the video monitor screen. They do not indicate any fault of the CCD camera, but do associate with typical CCD characteristics.

- V. smear

Due to an excessive bright object such as electric lighting, sun or strong reflection, vertical smear may be visible on the video monitor screen.

This phenomenon is related to the characteristics of Interline Transfer system employed in the CCD.



Video monitor screen

- V. aliasing

When the CCD camera shoots stripes, straight lines or similar patterns, jagged image on the monitor may be appeared.

- Blemishes

An array of individual sensor elements (pixels) in the CCD image sensor may consist of blemish, although it is not a problem in practical operation.

- Patterned noise

When the CCD camera shoots a dark object at high temperature, fixed pattern noise (dots) may be appeared over the entire area of the video monitor screen.

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## CV-S2500 TWIN series

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### 1. General

The CV-S2500 TWIN Series is a new revolutionary series of day/night CCD cameras, employing the latest DSP (Digital Signal Processing) technology.

The CV-S2500 TWIN camera offers state-of-the art performance without any moving parts. The camera is extremely IR sensitive and its features include RS 232C interface, on-screen-menu, AC line lock for roll-free switching, Back Light Compensation (BLC), etc.

### 2. Main features

- 1/3" Hyper HAD IT CCD imager, 768 (h) x 494 (v) for NTSC, 752 (h) x 582 (v) for PAL
- The 2nd generation DSP technology to reflect the advanced digital technology.
- High resolution: 450 TV lines (h)
- Excellent S/N: >46 dB
- Sensitivity: Color: 0.2 lux on sensor (50% video)  
Monochrome: 0.02 lux on sensor (50% video)
- 

#### Functions

AC line lock: The CV-S2500 TWIN series can synchronize with AC power line to maintain clear and roll-free switching.

Model name	AC power	AC line lock
CV-S2500 PAL	230 V	○
CV-S2500 NTSC	100/117 V	○
CV-S2524 PAL	24 V	○
CV-S2524 NTSC	24 V	○

On-screen-menu: Display function on monitor for camera set-up is provided to assure user-friendly operation via CR-1000/CR-1100 remote control units or RS 232C software.

BLC:  
(Back Light Compensation) BLC circuitry is utilized to assure a clear picture even in excessive highlights which often disturbs the picture quality. 2 sensing patterns are available for user's choice.

## **CV-S2500 TWIN series**

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Video reversal on Y/C:	Provision to reverse the picture image from positive to negative polarity.
Back focus adjustment ring:	Mechanical adjustment-ring on the camera front panel is provided for easy back focus adjustment.
Direct drive or video controlled auto iris lens:	Accept auto iris with and/or without built-in amplifier.
Color/monochrome switching :	This can be done by means of RS 232C, externally by the Y/C connector or automatically by DSP processor.

- Video output: VBS 1.0 Vpp
- Internal synchronization / AC line lock
- RS 232C interface

### **3. Standard composition**

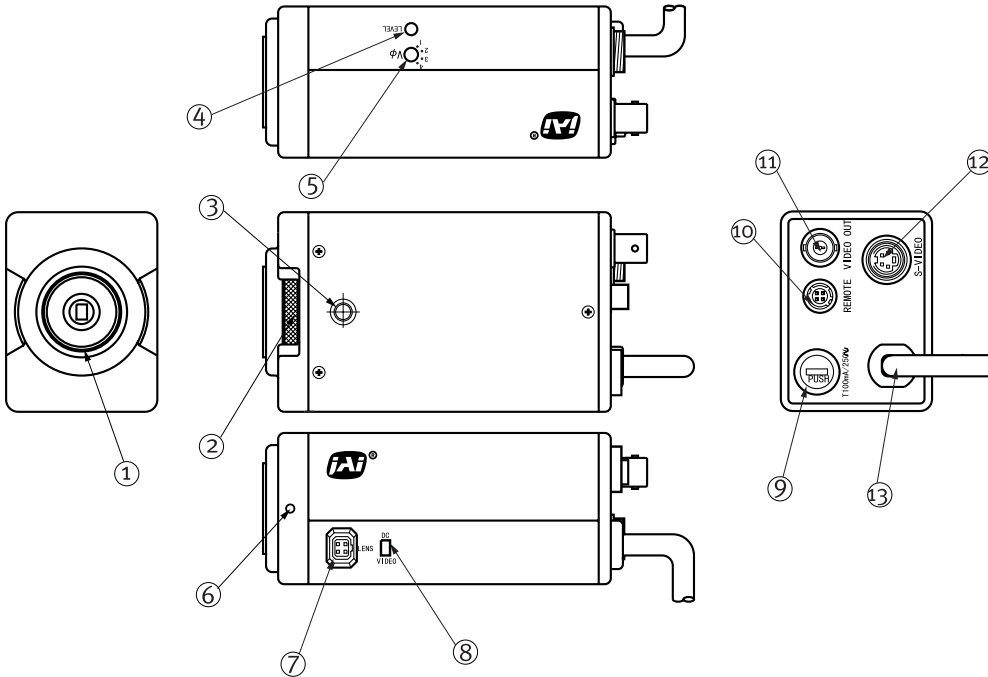
- a) Camera
- b) Operation manual
- c) Auto iris lens connector
- d) Y/C output connector
- e) MP-55 : C-mount adaptor

#### **Optional accessories**

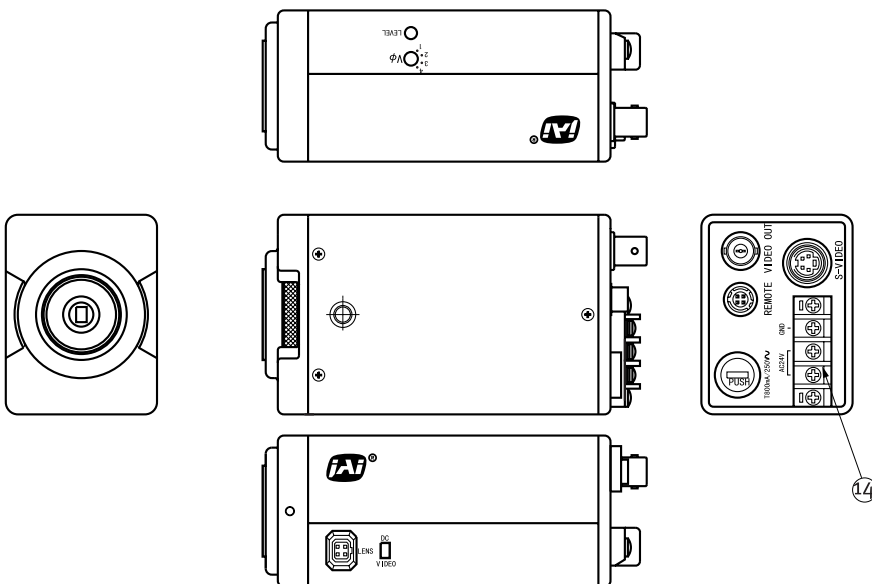
- a) CR-1000/CR-1100 : Remote control units with 3m cable
- b) RS 232C connector
- c) MRS-1000/2500 : RS 232C communication cable (2m)
- d) RS 232C software tool

## 4. Locations and functions

CV-S2500 NTSC/PAL



CV-S2524 NTSC/PAL



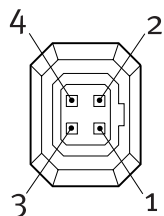
## CV-S2500 TWIN series

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①	Lens mount	:	CS-mount
②	Back focus adjustment ring	:	Mechanical adjustment ring for back focus adjustment
③	Screw hole for tripod plate	:	To connect the tripod
④	Auto iris level pot.	:	To adjust the level of auto iris
⑤	Phase select switch	:	To select the phase of AC power frequency
⑥	Focus lock ring	:	To fix back focus adjustment at proper position
⑦	LENS connector	:	Connector for auto iris lens
⑧	Auto iris ON/OFF switch	:	To select the type of auto iris
⑨	Fuse holder	:	To replace the fuse, turn the holder left
⑩	REMOTE connector	:	RS 232C or remote control connector
⑪	VIDEO connector	:	Video output connector
⑫	S-VIDEO connector	:	Y/C output and day/night sensitive mode connector
⑬	AC power cable	:	AC 230V for CV-S2500 P, AC 100/117V for CV-S2510 N
⑭	AC power terminal	:	AC 24V terminal for CV-S2524 N/P

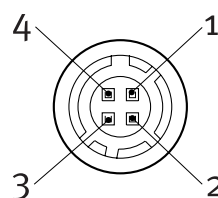
## 5. Pin assignment

### 5-1. LENS connector



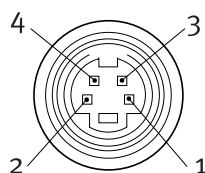
1. +9 V / Damp-
2. NC / Damp+
3. Iris / Drive+
4. Ground / Drive-

### 5-2. REMOTE connector



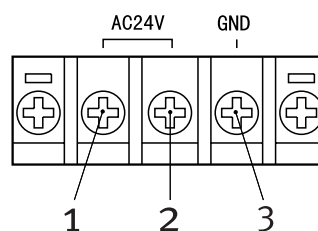
1. TXD
2. RXD
3. Ground
4. +3.3 V output

### 5-3. S-VIDEO connector



1. Color / B/W switch
2. Ground
3. Y output
4. C output

### 5-4. AC power terminal

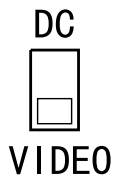


1. Live
2. Ground
3. Neutral

## **6. Functions and operations**

### **6-1. Switches and potentiometers on camera cover**

a) Auto iris ON/OFF switch      This switch is to select the type of auto iris.



DC : Direct drive mode (Passive)  
VIDEO : Video controlled (Active)

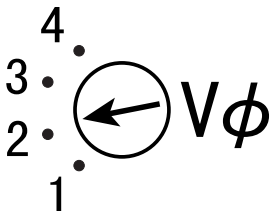
Note : Factory pre-set is set at Video controlled.

b) Auto iris level pot.      This potentiometer is used to adjust the iris level.



Turn clock wise : To higher level  
Turn counter clock wise : To lower level

c) Phase select switch      This switch is to select the phase of AC power frequency.



4. Internal sync.  
3. +120°  
2. 0°  
1. -120°

Note : Factory pre-set is set at 0°.

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### 6-2. Day/night sensitive mode

The CV-S2500 TWIN offers high-resolution color image during daylight. At night, it switches to the high sensitivity monochrome camera. This mode can be selected by RS 232C, externally by the Y/C connector or automatically by DSP processor.

#### a) Auto mode (Factory pre-set)

The camera switches from color to monochrome and vice versa depending on the actual light level.

#### **CAUTION**

To use the day/night sensitive mode in Auto, the AGC must be set at ON position. (AGC is set at ON position for factory pre-set).

#### b) Manual mode

To set the day/night mode at manual, please use the RS 232C software and select the manual mode. Then make pin no.1 of S-VIDEO connector short-circuited (monochrome camera) or open-circuited (color camera). For more information of connector, please refer to page 4.

## CV-S2500 TWIN series

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### 6-3. On-screen-menu

On-screen-menu is available when the CR-1000/CR-1100 remote control unit is connected with the camera.

#### 6-3-1. Functions

The following functions are adjustable by using the CR-1000/CR-1100 remote control unit.

Item	Mode
White balance	Auto/Select/One push/Manual
Electronic shutter	OFF/Select/CCD iris/Flicker less
Auto iris gain control	OFF/ON/Manual
BLC	OFF/Pattern 1/Pattern 2
Nega-posi reversal	OFF/ON
Camera title	OFF/ON

#### a) White balance

This function is to adjust the color temperature to make the color of the image correct.

4000 °K : For incandescent lamp or halogen lamp.

4600 °K : For white fluorescent lamp.

5600 °K : For daylight.

Auto : Due to TTL system employed for auto white balance, it detects the highest video level in objects to recognize a white color. Therefore, it is necessary to place the camera to proper position where the camera does not pick up the high luminance light source such as spot light and fluorescent.

One-push : To use the one-push white balance , place a white object (e.g. a sheet of paper) in the field of view, and press the button. When released, the white balance has been calibrated.

Manual : To adjust the color temperature between 4000 °K to 6300 °K.

Note : Factory pre-set is set at auto white balance.

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### b) Electric shutter

This function is to shoot a moving object with minimal blurring. The exposure time is controlled by 9-step fixed shutter.

OFF : 1/60 sec. (NTSC), 1/50 sec. (PAL)

Selectable shutter : 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10,000 sec.

Flicker-less : 1/100 sec. (NTSC), 1/120 sec. (PAL)

Auto shutter : Shutter speed changes automatically.  
(1/60 sec. to 1/10,000 sec. (NTSC), 1/50 sec. to 1/10,000 sec. (PAL))

Note : Factory pre-set is set at OFF.

### CAUTION

1. Under certain unique light conditions, the following may appear.
  - Strong smear and/or blooming on highlighted objects.
  - Noticeable flicker in the picture.

#### Auto shutter/CCD iris

Continuously variable electronic shutter is employed to control times automatically in the CCD sensor, according to the incoming light level. When this mode is selected, a or manual iris lens can be used instead of an auto iris lens.

### c) AGC (Auto gain control)

OFF : Gain is fixed at minimum 0 dB

ON : AGC ON (0 to 18 dB at color mode, 0 to 24 dB at B/W mode)

Manual : Manual gain (0 to 18 dB)

Note : Factory pre-set is set at AGC ON.

### CAUTION

1. For using the day/night mode automatically, it is necessary to set the AGC at ON position.
2. Auto iris lens can be used under the condition of AGC ON, CCD iris OFF.

## CV-S2500 TWIN series

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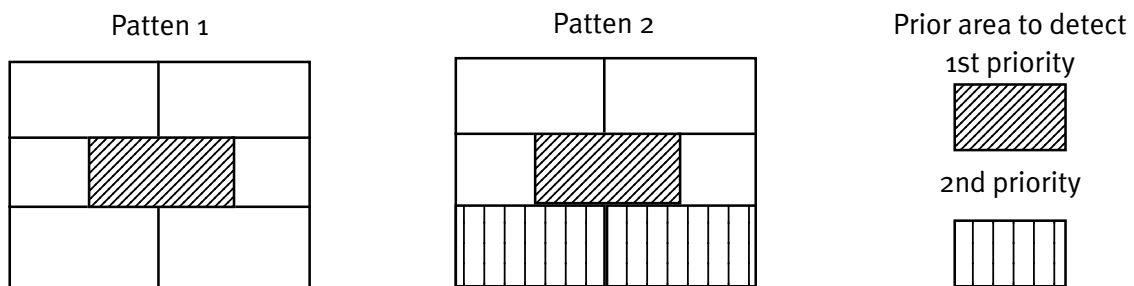
### d) BLC (Back Light Compensation)

BLC circuitry is to compensate for extreme highlights in the field of view.

OFF : Standard

Pattern 1 : Designated area is center part of the image

Pattern 2 : Designated area are center and lower part of the image



Note : Factory pre-set is set at OFF.

### CAUTION

- Please note that BLC does not work at AGC OFF and CCD iris OFF.

BLC	○	○	○	×
AGC	ON	ON	OFF	OFF
CCD iris	ON	OFF	ON	OFF

○ : Effective

× : Not-effective

- It is recommended to set this switch to the “BLC OFF” position when using the camera with pan/tilt head or if the field of view has a rapid change in illumination, since the iris becomes slow with “BLC ON”.
- If the objects of interest are not located the 1st priority area of the picture, BLC may not work effectively.

### e) Video reversal on Y/C (Negative/positive reversal)

OFF : Positive

ON : Negative

Note : Factory pre-set is set at OFF.

## CV-S2500 TWIN series

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f) Camera title

OFF : Title is not displayed on the monitor

ON : Displays the title on the left-lower side.

Note : Factory pre-set is set at OFF.

### 6-3-2. Operations

Screen display (example)

White balance	Auto
Shutter	Off
AGC	On
Back-light	Ptrn. 1
NEGA	Off
Camera-Title	On
ABCDEFGH	←

Note :

The characters are flashing when they were selected.

← The word which you input for camera title.

- To start adjustment, push "DISPLAY" button so that the menu will appear on the monitor as above.
- Use ▲ or ▼ key to select functions. (e.g. White balance, Shutter, etc.) The selected function will be flashing.
- While function is flashing, press ► key to select mode. (e.g. Off, On, etc.) The selected mode will be flashing.
- Press ▲ or ▼ key to change the mode.
- Go to the next function if needed, and repeat (b) to (d).

For more information, please refer to the operation manual for CR-1000/CR-1100.

Note : When White balance and AGC are selected at manual, each level can be adjusted as below.

Cursor	AGC	White balance
▲	To red	To max.
▼	To blue	To min.
PUSH	Return to mid-range value	

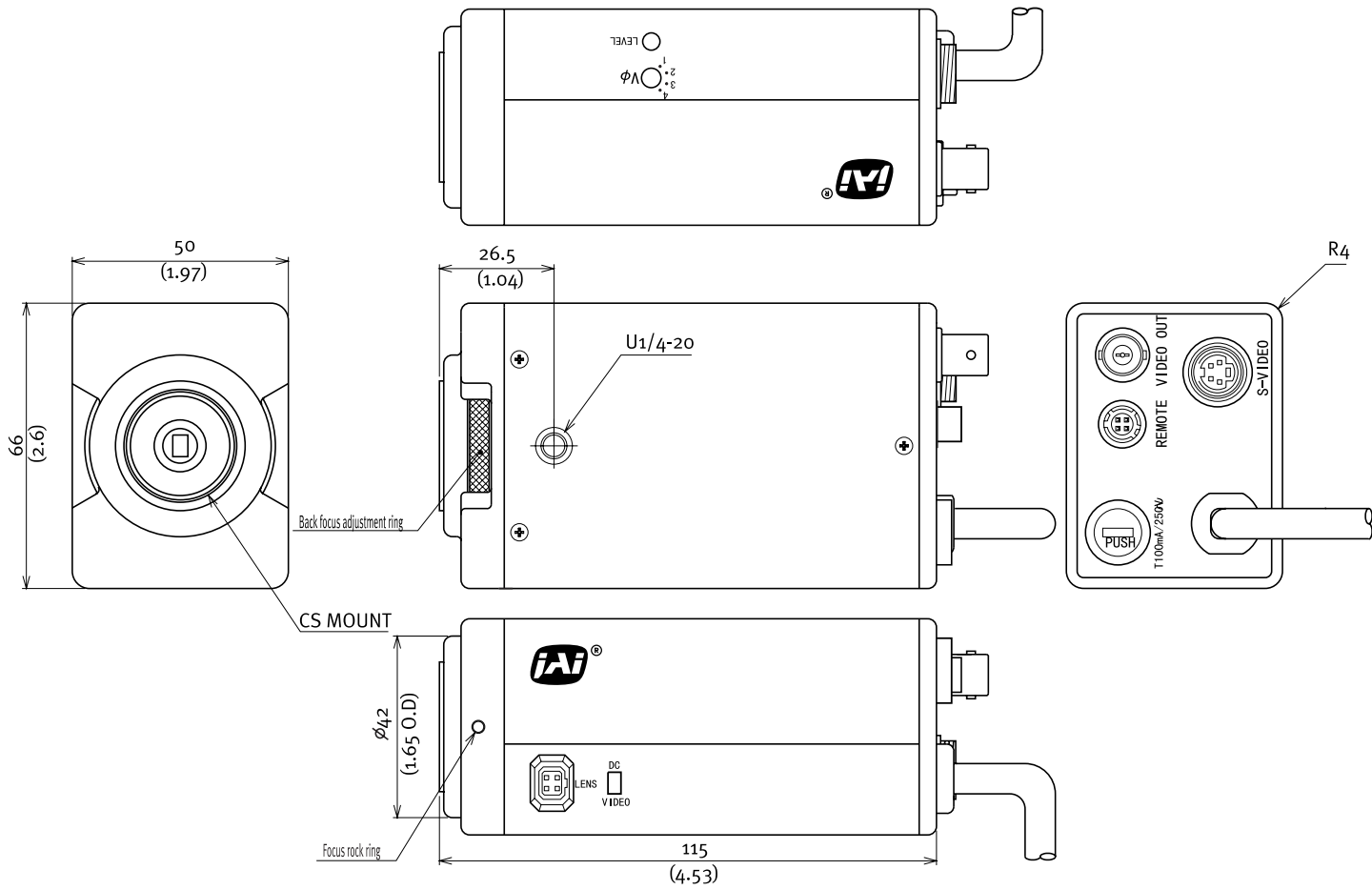
### 6-4. RS 232C functions (Full version)

- a) White balance : To adjust the color temperature
- b) Electronic shutter : To adjust the shutter speed
- c) Auto gain control : OFF, ON, manual selectable
- d) Back light compensation : To select the designated area which has different luminance level
- e) Video reversal on Y/C : Negative, positive selectable
- f) Enhancer : H. and V. aperture correction
- g) Gamma : 0.45, 0.60, 1.0 selectable
- h) Chroma : Color correction
- i) Set up level : Black level adjustment
- j) White clip : To adjust the video signal's clip point
- k) CCD iris level : To adjust the video level when CCD iris is ON or AGC is ON.
- l) R-Y HUE : Color correction
- m) B-Y HUE : Color correction
- n) Day/night sensitivity : Auto, manual selectable

**7. External appearance**

Unit : mm (inches)

e.g. CV-S2500 P



### 8. Specification

TV standard	NTSC	PAL
Scanning system	525 lines, 2:1 interlace	625 lines, 2:1 interlace
CCD sensor	1/3" Hyper HAD IT CCD	
Sensing area	4.9 mm (h) x 3.7 mm (v)	
Effective pixels	768 (h) x 494 (v)	752 (h) x 582 (v)
Cell size	6.35 $\mu$ m x 7.4 $\mu$ m	6.5 $\mu$ m x 6.25 $\mu$ m
Resolution (h)	450 TV lines	
Sensitivity	Color : 1,000 lux (F8) Monochrome : 600 lux (F8)	
Min. illumination (on sensor)	Color : 0.2 lux (50% video) Monochrome : 0.02 lux (50% video)	
S/N ratio	> 48 dB	
Video output	Color : Composite VBS signal 1.0 Vpp at 75 Ohm Y/C signal 1.0 Vpp at 75 Ohm Monochrome : Composite VS signal 1.0 Vpp at 75 Ohm	
White balance (color)	3200K, 4600K, 5600K, Auto, Manual, One-push	
White balance range	4000K to 9000K	
Color/monochrome switching	By RS 232C : Auto/manual (When the switching is set at manual, it is necessary to set the pin no.1 of S-VIDEO connector at open/short for color/monochrome)	
Shutter functions	OFF (NTSC : 1/60, PAL : 1/50), 1/125, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10,000 sec. CCD iris, Flickerless (NTSC : 1/100, PAL : 1/120)	
Back light compensation	OFF, Pattern 1, Pattern 2	
Camera set-up (CR-1000 and CR-1100)	White balance, Shutter, Gain, BLC, Video reversal, Camera ID	
Camera set-up (RS 232C)	White balance, Shutter, Gain, BLC, Enhancer, Gamma, Set-up level, White clip, CCD iris level, R-Y/B-Y, Color/monochrome	
Serial interface	RS 232C	
Control software	Please down load this from <a href="http://www.jai.com">www.jai.com</a>	
Gamma	1.0 or 0.45 or 0.6	
Gain range	Color : 0 to +16 dB Monochrome : 0 to +24 dB	
Iris control	Direct drive or video controlled	
Iris direct drive	$\pm$ Drive and $\pm$ Damp, Level adjust	
Line lock phase select	-120°, 0°, +120°	
Synchronization	Internal X-tal / AC line lock	
Lens mount	CS mount or C mount (with optional adaptor) with back focus adjustment	
Operating temperature	-5°C to +45°C	
Operating humidity	20% to 80%, non-condensing	
Power	24/117/230V AC, 50/60Hz, 4.5W	
Dimensions	50 x 66 x 115 mm (HxWxD)	
Weight	600 g	

Note : Above specifications are subject to change without notice.

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