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CERTIFICATE No.  
JMI-0062  
ISO 9001/BS 5750P11  
EN 29001/JIS Z9901

# HITACHI

## HV-C20A SERIES

COMPACT, LIGHTWEIGHT, HIGH-PERFORMANCE

## C-MOUNT 3CCD COLOR CAMERAS



3CCD camera with 1/2" high-performance CCD sensors





A new C-mount type prism and advanced IC technology are combined to make possible a high-performance, compact, lightweight camera.

# HV-C20A Series

The HV-C20A C-mount 3CCD color cameras are equipped with a newly developed C-mount prism that allows direct combination with a C-mount lens or a C-mount type optical equipment like a microscope. Thanks to the 1/2-inch 410,000-pixel CCD with micro lenses, the HV-C20A series cameras provide high resolution and superb sensitivity. Palm size construction is obtained through the extensive use of IC's, resulting in a compact, light-weight design with low power consumption. The HV-C20A series is designed to meet the need of a wide range of systems such as teleconference, image processing and optical instrumentation.

Multi-purpose camera

## HV-C20A

DC operation

- For TV conference system
- For image processing system
- For document transmission system
- For observation system

For optical equipment

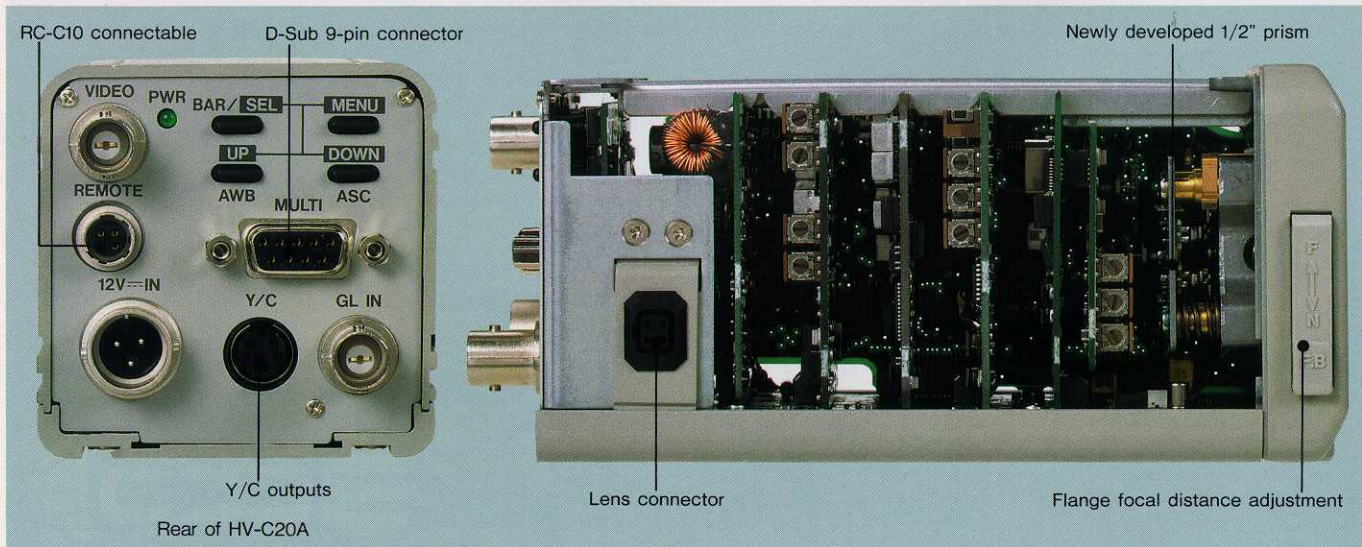
## HV-C20AM

DC operation

- For optical equipment including a microscope

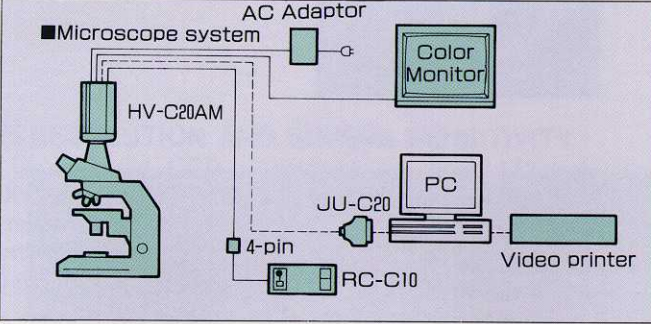
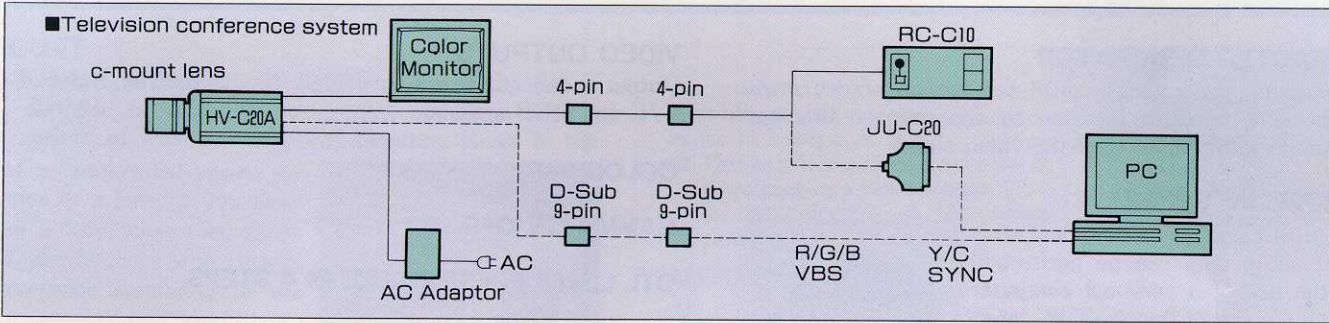


### Operation panel of camera head and unit arrangement

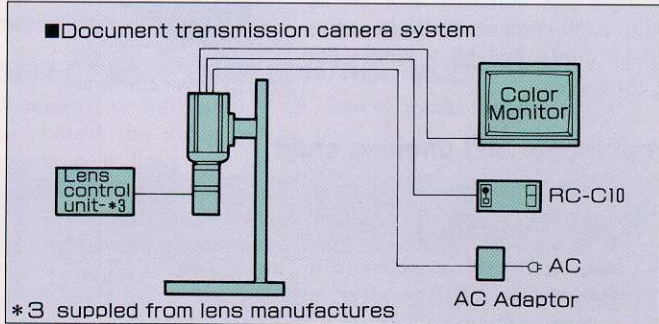




# System Configuration



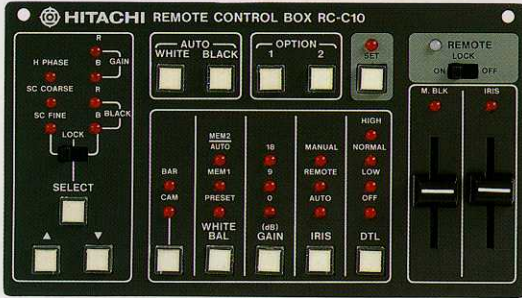
for RS-232C line



\* 3 supplied from lens manufactures

## Accessories

### Remote control box RC-C10

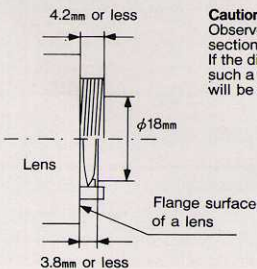


### ● specifications

Serial data output: 1.5 Vp-p  
 Maximum cable length: 200m (HC-5B2 cable or equivalent)  
 Power supply: 9 to 15V DC (Supplied from camera)  
 Ambient temperature: +5 to 40°C  
 Power consumption: Approx. 0.5W  
 Dimensions and mass: 140(W) × 80(H) × 40(D)mm, 0.5kg approx.

### ● Recommended Lens

- 10x : H10ZAME-R7.5mm
- Zoom lens 10x : S10×8DB-SNS21 8mm(Fujinon)
- 10x : PH10×8R-II 8mm(CANON)



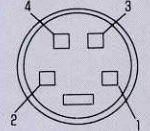
**Caution**  
 Observe the dimensions of the lens mounting section as illustrated at the left. If the dimensions are not observed, do not use such a lens, because the lens and the camera will be damaged.

### ● LENS connector

Pin number	Signal
1	+12V output
2	+5V/High
3	IRIS CONT/VIDEO
4	GND

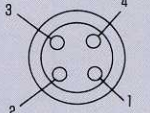
### ● Y/C connector

Pin number	Signal
1	Y GND
2	C GND
3	Y output
4	C output



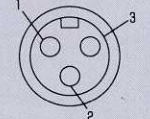
### ● REMOTE connector (Plug, HR10A-7P-4P)

Pin number	Signal
1	+12V output
2	SD input
3	SD output
4	GND



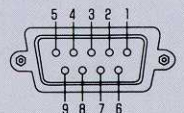
### ● 12V in connector (Plug, RM12BPG-35)

Pin number	Signal
1	+12V input
2	GND
3	NC



### ● D-Sub 9-pin connector (Plug, HDEB-9PF(0.5))

Pin number	Signal(Selected R/G/B)
1	GND
2	WE output
3	R(RED) output
4	G(GREEN) output
5	B(BLUE) output
6	VBS output
7	SYNC output
8	HD output/TRIG B input * 1
9	VD output/TRIG A input * 1



\* 1 Output and input can be switched by the switch in the camera. This switch is set to output at factory.



## CHARACTER GENERATOR

A character generator is used for the on screen menu system and can also be used to superimpose title and camera ID information over the video signal.

## RS-232C INTERFACE

Control of camera functions and storage of setup data can be performed with the use of a personal computer through the use of the RS-232C interface. Since ID numbers can be assigned to each camera, multiple cameras can be controlled by a single personal computer.



JU-C20 Level converter

## VIDEO OUTPUTS

Output connectors are provided for composite video, Y/C and RGB signals.

## COLOR BAR

## GAMMA ON/OFF

## DTL LEVEL PRESETTABLE IN 4 STEPS

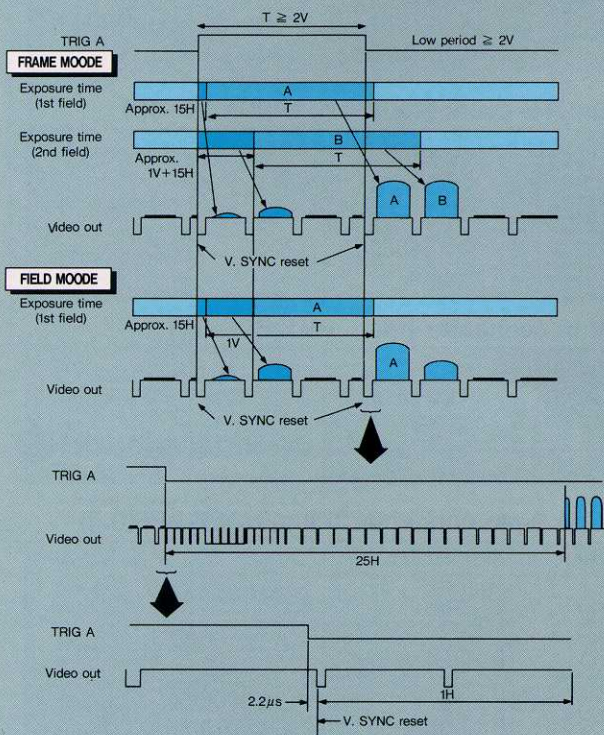
## External trigger and timing chart

### One trigger mode

The exposure is started by the rising edge of the TRIG A pulse, and V. SYNC is reset at the same timing.

After V. SYNC is reset by the falling edge of the TRIG A pulse, and after reset, two fields (one frame) image are output.

A exposure time is controlled by the duration (T) when the TRIG A pulse is high.

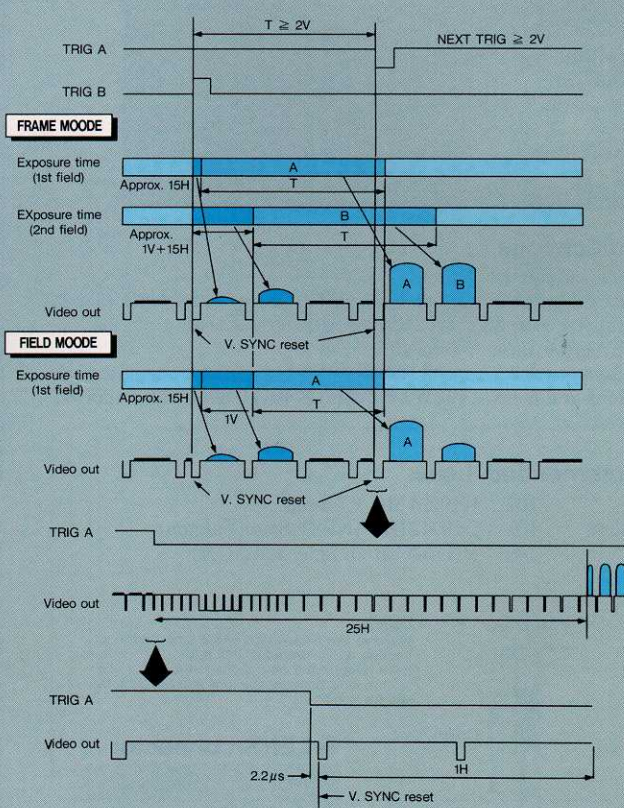


### Two trigger mode

The exposure is started by the rising edge of the TRIG B pulse, and V. SYNC is reset at the same timing.

After V. SYNC is reset by the falling edge of the TRIG A pulse, two fields (one frame) or one field image are output.

A exposure time is duration (T) between the rising edge of TRIG B and the falling edge of TRIG A.





## C-MOUNT

A C-mount type lens mount is employed and the flange focal distance is adjustable to permit operation with a wide variety of lenses and optical adapters. Refer to the list of recommended lenses for selection of a lens. If you want to use a lens other than those listed, please check with Hitachi to determine suitability of the lens.



## HIGH RESOLUTION AND SUPERB SENSITIVITY

Use of advanced CCD technology and three 1/2 inch 410,000-pixel CCD's with micro lenses results in a horizontal resolution of 700 TV lines. Standard sensitivity setting is 2000 lx at f8.0, while a minimum illumination level of 5.5 lx will produce a usable picture.

## COMPACT, LIGHTWEIGHT, LOW POWER CONSUMPTION

Extensive use of custom IC's and high density surface mount technology enable a reduction in camera size to 65(W)×65(H)×130(L). Camera weight is reduced to 600g and power consumption is a low 4.5 watts.

## ON SCREEN MENU SYSTEM

A comprehensive menu system featuring a main menu and multiple levels of sub-menus allows complete adjustment and configuration of the camera to meet the needs of the user. 256 steps of adjustment for RB gains and black levels allow for precise color adjustments in the manual mode of operation.

### Example 1

```

---MAIN MENU---
CAM MODE :MANU
WHT BAL  :PRESET
PRESET   :3200K
SHAD MODE:COLOR
AGC      :OFF
GAIN     :HIGH
HIGH     :+9dB
SUB MENU
LEVEL/SYNC
ADJUST
    
```

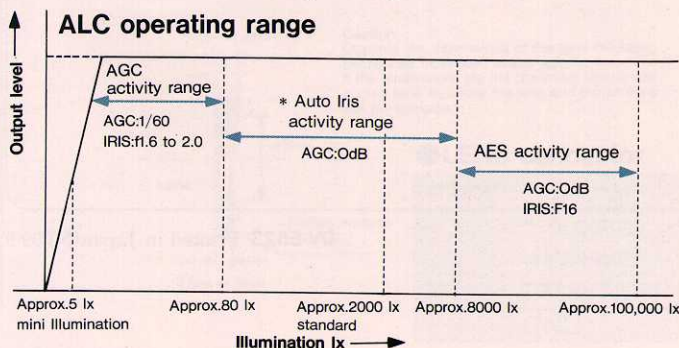
### Example 2

```

---SUB MENU---
SHUTTER :Var
Variable:1/10040
DTL     :OFF
GAMMA   :ON
CONTRAST:ON
KNEE    :ON
FLD/FRM:FLD
IRIS GATE
LENS
RETURN
    
```

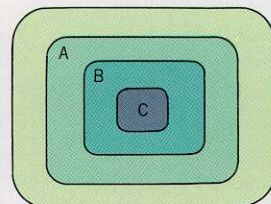
## AUTO MODE

Unattended operation under a wide range of illumination levels is possible with the selection of the auto mode from the main menu. The built-in microprocessor controls the gain (AGC) function, the auto electronic shutter (AES), and auto iris function so the proper video level is maintained over a wide range of light levels.



According to subject condition, it is possible to adjust the ALC gate range in 3 steps: A, B, C.

\*1 The lens iris can be driven by a DC voltage or a video signal. This can be selected on the menu screen.



## AUTO SHADING

An automatic shading correction mode can be selected to compensate for vertical shading that may occur in C-mount lens systems.

## SELECTABLE GAIN CONTROL MODE

A manual or automatic gain control mode can be selected to control the video output level. In the AGE mode, the upper gain limit can be programmed between 6 dB and 18 dB in steps of one dB. For manual gain, the high and the maximum gain settings are programmable in steps of one dB, up to a maximum of 18 dB.

## THREE WHITE BALANCE MODES

1. A real time auto white mode can be selected to maintain proper color balance with changing color temperatures.
2. Auto white balance can be achieved and stored in memory for a scene with a fixed color temperature.
3. A preset mode of white balance can be selected for color temperatures of 3,200 to 5,600K.

## IRIS GATE

Operation under extreme backlight conditions is made possible through user selection of gate size and gate area to determine which portion of the picture will be used by the microprocessor to control video level. Depending on mode of operation, level is controlled by AGC, lens iris, or the auto electronic shutter.

## CONTRAST

A contrast mode can be selected to increase the brightness level of dark portions in a scene.

## KNEE

A knee circuit is used to allow gradual compression of extreme highlights before clipping occurs effectively increasing the dynamic of the camera.

## FIVE CCD DRIVE MODES

1. A preset electronic shutter with 8-steps can be employed to eliminate blur on fast moving subjects.
2. Variable speed shutter (lock scan) with a range of 1/60.38 to 10,040 in 1 H steps can be used to eliminate roll when shooting computer monitors.
3. Auto electronic shutter (AES) can be used by the microprocessor to control video level.
4. Field/Frame mode of integration with times up to 8 second allows increased sensitivity when shooting objects under low illumination. (\*1)
5. External mode allows frame and field integration to capture an image in synchronization with external trigger. (\*1)

(\*1) A memory is required to obtain images continuously.



## Specifications

Color system	PAL
Optical system	1/2" f1.6 prism
Imaging system	RGB system, 3CCDs
Imaging device	1/2" CCD
Total number of pixels	PAL:795(H) × 596(V)
Effective number of pixels	PAL:752(H) × 596(V)
Sensing area	PAL:6.47(H) × 4.83(V)mm
Sync system	Internal or gen-lock (automatic changeover)
Horizontal resolution	700 TV lines (Y signal, at center) 580 TV lines (RGB signals) (HV-C20/C20M)
S/N	58dB typ.(PAL) (Gamma=1, DTL OFF, Gain: 0dB)
Standard sensitivity	2000 lx, f8
Minimum illumination	5.5 lx
Gamma correction	0.45 or 1.0
Preset color temperature	3200K, 5600K
Vertical contour correction	1H
Lens mount	C-mount (BF=17.526mm)
Gain selection	0 to 18dB (in 1dB steps, or AGC)
Electronic shutter	
Preset mode	1/100, 1/250, 1/500, 1/1,000, 1/2,000, 1/4,000, 1/10,000s
Lock scan mode	PAL:1/50.31~1/10.040s PAL
Automatic electronic shutter (AES)	OFF to approx. 1/1,000S (Continuously variable up to a level equivalent to 4 lens stops in 1H steps)
Long time integration	1/25 to 8s (1 frame steps) * 2
Color bar	Full color bar
Power supply	● 12VDC rated (10.5 to 17V, no ripple noise)

Power consumption	Approx. 4.5W
Operating ambient temperature	-10 to +45°C
Storage temperature	-20 to +60°C
Dimensions	65(W) × 65(H) × 130(D)mm
Mass	Approx. 600g (HV-C20/C20M)

(\* 2) The image memory is required to obtain continuous images.

## Input/Output Signals

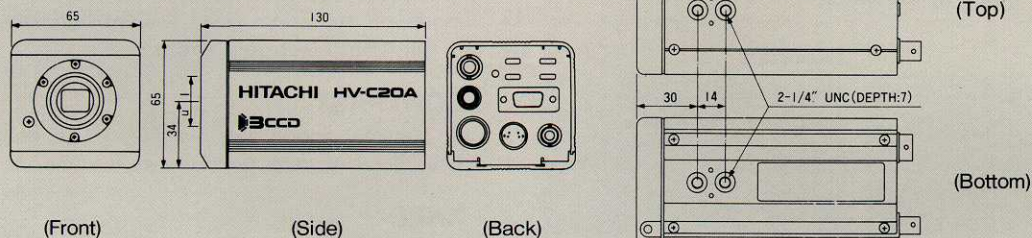
Input signal condition	
Gen-lock input (BNC)	VBS: 1.0Vp-p ±3dB or, black burst: 75Ω or HIGH (Sync: 0.3±0.1 Vp-p Burst: 0.3±0.1 Vp-p)
TRIG input (D-sub)	TRIG A/B: 4Vp-p/HIG
Serial data input (4-pin)	1.5Vp-p/HIGH
Output signal rating	
Composite video output (BNC)	VBS:1.0Vp-p/75Ω
Y/C outputs (S terminal)	Y:1.0Vp-p/75Ω C: 0.28ΩVp-p (burst)/75Ω
RGB output (D-Sub)	R:0.7Vp-p/75Ω G:0.7Vp-p/75Ω B:0.7Vp-p/75Ω
Sync output (D-Sub)	HD:2Vp-p/75Ω VD:2Vp-p/75Ω Sync: 2Vp-p/75Ω
Serial data output (4-pin)	1.5Vp-p/LOW

## Standard Composition

Camera .....	1
Accessories	(3) Power plug (HV-C20/C20M).....1
(1) C-mount cap .....	1 (4) Lens plug.....1
(2) Operation manual .....	1 (5) Warranty card.....1

## Dimensions

### ● HV-C20A/HV-C20AM



unit:mm

The specifications and appearance are subject to change without notice for improvement.

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