

CCD Color Camera

KP-D20A R1 KP-D20B

OPERATION MANUAL

Thank you for procuring this fine Hitachi Kokusai Electric color CCD camera.

Before using the camera, please read this operation manual carefully and keep this manual on file for ready reference in the future.



Hitachi Kokusai Electric Inc.

MGA2502

General

KP-D20A/B color camera uses a single integration type CCD complemented by a digital signal processing system to provide both high quality images and a host of important compensation functions.

The high density CCD features 380,000 effective picture elements (440,000 PAL) that deliver clear images even under low light conditions. Digital control enables fully exhibiting the outstanding sensitivity and resolution capabilities.

Features

Small, Compact, Self-contained color camera

- The camera requires a small space for installation, allowing use for various purpose and conditions.

High sensitivity, high resolution

KP-D20A

- The high density interline type CCD sensor with on-chip microlenses enables low-light pickup down to 1.5 lx (with F1.2 lens, AGC maximum) and Horizontal resolution of 480 TV lines (NTSC), 470 TV lines (PAL).

KP-D20B

- The high density interline type CCD sensor with on-chip microlenses enables low-light pickup down to 1.0 lx (with F1.2 lens, AGC maximum) and Horizontal resolution of 480 TV lines (NTSC), 470 TV lines (PAL).

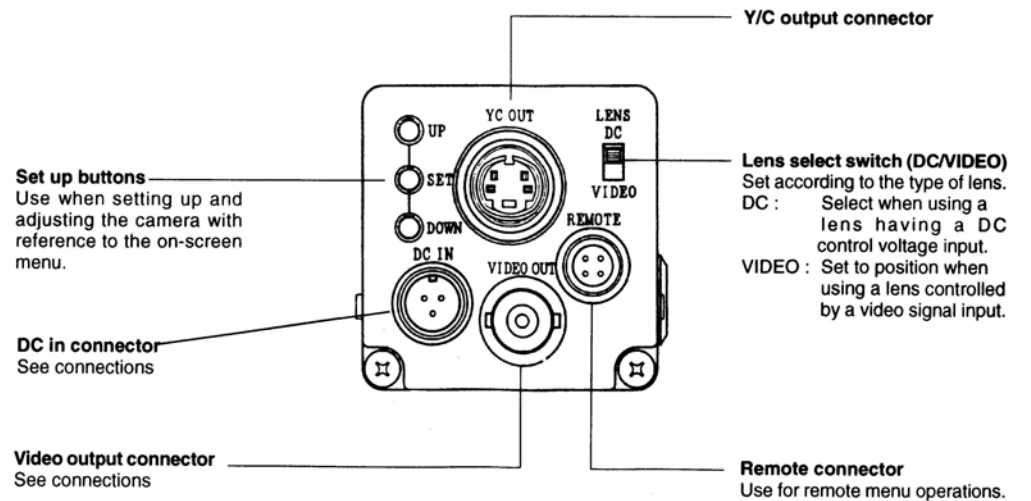
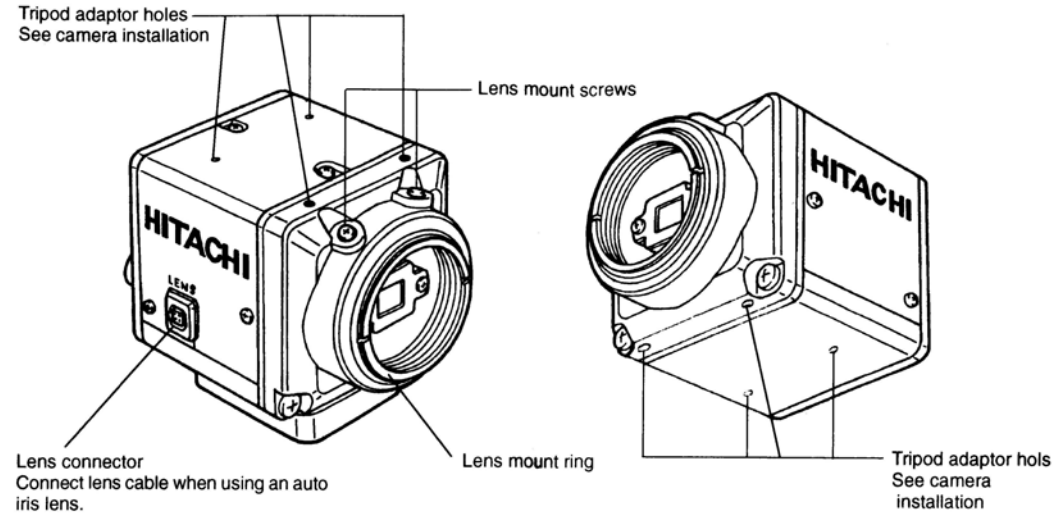
High picture quality

- Digital signal processing LSI.
- Contour compensation by digital technology and 2H vertical enhancer.

Various functions

- Backlight correction (BLC)
- Auto tracking white balance (ATW)
- Auto electronic shutter control (AES)
- Text display (character generator)
- Digital zoom
- Y/C output
- RS-232C remote control

Section names and function



Operating considerations

Power supply

- Be sure to use the power source specified in the Major Specifications.
- Before plugging or unplugging a connector, be sure to turn off power.
- To plug or unplug a connector, be sure to hold the connector section.
- Note that it will take several seconds until a picture is displayed on the monitor after power on.

Handling

- Do not attempt to remove cover.
- When installing or removing a lens, be sure to use care that water or dust does not enter the inside of the camera.

Installing and storage

- Avoid installing or storing the camera in the following environments.
- Environments exposed to direct sunlight, rain or snow
 - Environments where combustible or corrosive gas exists
 - Excessively warm or cold environment (Operating ambient temperature: -10 to 50°C)
 - Humid or dusty environment
 - Place subjected to excessive vibration or shock
 - Environment exposed to strong electric or magnetic field

- Do not aim the camera lens at the sun.
- Do not shoot strong light or a scene including strong light. When such a scene is shot, vertical trailings will appear. However, this is not due to failure. In case strong light enters the camera through the lens, partial deterioration in picture quality will result.

To obtain stable performance for long time

When the camera is used continuously for long time under high ambient temperature, the inside electrical parts become deteriorated, resulting in shortening its life. To use the camera continuously for long time, the highest temperature must be below 40°C.

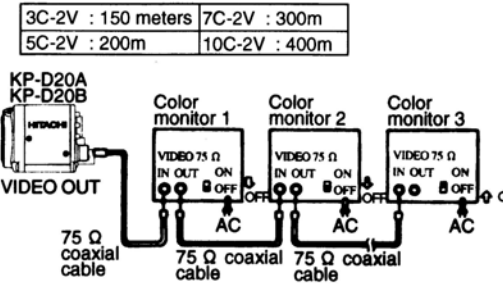
Cleaning

- Use a blower or a lens brush to remove dusts on the lens or the optical filter.
- Wipe dirt on the case off with dry soft cloth. If dirt is hardened, wipe them off with cloth moistened with neutral detergent liquid; wipe the cover with dry cloth.
- Do not use benzene, thinner, alcohol, liquid cleaner or spray-type cleaner.

Connections

Video output connection

Connect the video output of the camera to the video input of a monitor or other equipment. When using a "loop through" connection of two or more monitors, set the 75 Ω switch of only the final monitor to ON. Determine the type of cable according to the distance of the connected equipment. The maximum cable lengths indicated below are recommended for avoiding appreciable picture degradation.

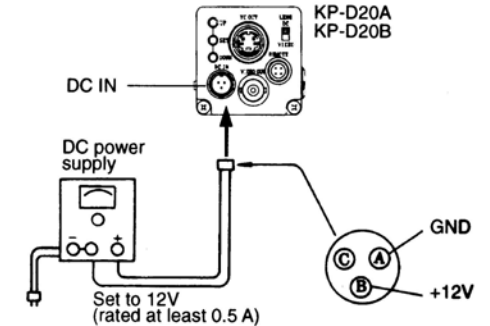


Set the 75 Ω switch of only the final monitor to on. Set the 75 Ω switch of other monitors to off.

External power supply connection

Use a stabilized 12 VDC ($\pm 10\%$) power supply rated at 0.5 ampere or greater. Wire the accessory 3-pin DC plug as shown in the figure for connecting the power supply to the camera.

Caution: Be sure to confirm proper polarity before switching on power.



Phenomena inherent to CCD imaging device

Following are the phenomena inherent to a CCD imaging device, and not defects

1) Smear and blooming

When strong light (lamp, fluorescent lamp, reflected light, etc.) is shot, pale bands are displayed vertically above and below the light.

In this case, change the angle of the camera so that such strong light does not enter the camera through the lens.



2) Fixed pattern noise

When the camera is operated in a high temperature, fixed pattern noise may appear on the entire screen.

3) Moire

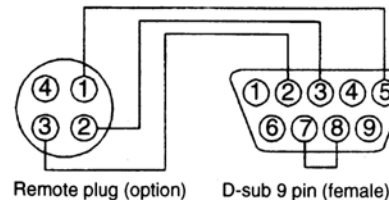
When fine patterns are shot, moire may be displayed.

4) Burning

When excessively intense light comes to the CCD for a long time, the spectral filter in the CCD pixel may be deteriorated, and the color of the corresponding portion may change. Avoid using the camera under such condition.

Remote connection

This camera can perform remote control of various setup of a camera with a personal computer. Please perform wiring as shown in a figure to an optional remote plug, and connect with the remote connector on the back of a camera after checking wiring correctly.



Pin No.	Signal name
1	GND
2	Serial data camera input
3	Serial data camera output
4	N. C.

Note

- Nothing should connect with NC pin.
- Please perform extraction and insertion of a remote plug after turning off a camera power supply.

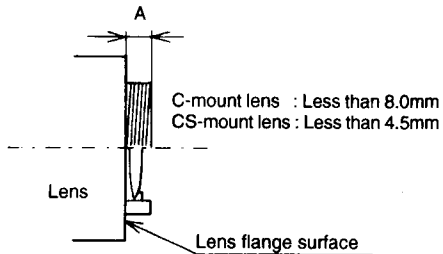
Lens

Note on lens selection

- 1) Observe the maximum size limit (A in the figure) when installing the lens. Internal damage can occur if a larger lens is used.
- 2) Avoid using a lens that is heavier than the camera. If unavoidable, be sure to fix the lens itself on a support.

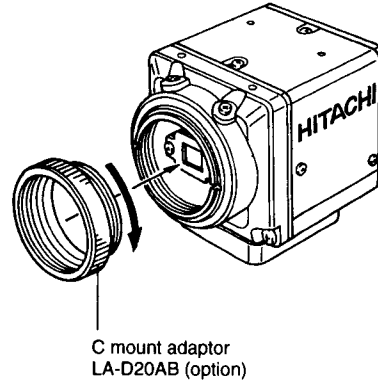
Caution:

A heavy lens can disturb the balance with respect to the camera and possibly result in damage.



Installation of C-mount lens

This camera attaches CS mount lens. As shown in a figure, when you use C mount lens, C mount lens adaptor (option) is attached.



Lens selector switch

Set the switch according to the type of auto-iris lens. The factory setting is DC.



DC : Set to **DC** when using a lens having a DC control voltage input.

VIDEO : Set to **VIDEO** when using a lens having a video signal input.

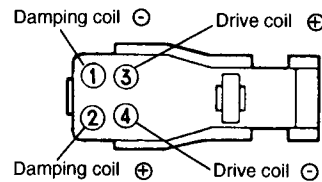
Notes

1. To the extent possible, set the lens response to Average. Hunting can occur toward the Peak setting.
2. Set the switch to DC when using a manual iris lens with auto electronic shutter (AES) at the same time.

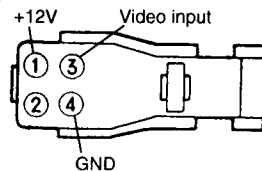
Lens connector

When using an auto iris lens, install the lens plug on the lens cable as indicated in the figures. Refer to the lens instructions regarding the signals and wire colors.

DC type lens



VIDEO type lens



After installing the plug on the cable, connect it to the Lens connector on the rear of the camera.

Main specifications

1 Color system	NTSC/PAL	5 Sync system	Internal
2 Pickup element	Interline transfer type CCD	6 Signal processing	Internal digital processing (input: 10 bits, output: 8 bits)
Total pixels	NTSC 811(H)×508(V) PAL 795(H)×596(V)	7 Video signal output	VBS 1.0 Vp-p/75 Ω Y/C output Y=1.0Vp-p/75 Ω C=0.3Vp-p/75 Ω
Effective pixels	NTSC 768(H)×494(V) PAL 752(H)×582(V)	8 Resolution	Hor. NTSC 480 lines PAL 470 lines Ver. 350 lines
Scanning area	KP-D20A NTSC 4.88(H)×3.66(V)mm PAL 4.89(H)×3.64(V)mm (equivalent to 1/3-inch) KP-D20B NTSC 6.45(H)×4.84(V)mm PAL 6.47(H)×4.83(V)mm (equivalent to 1/2-inch)	9 S/N (luminance signal)	More than 50 dB (AGC, enhancer and gamma OFF)
Unit cell size	KP-D20A NTSC 6.35(H)×7.4(V)μm PAL 6.5(H)×6.25(V)μm KP-D20B NTSC 8.4(H)×9.8(V)μm PAL 8.6(H)×8.3(V)μm	10 Minimum illumination	KP-D20A 1.5 lx (F1.2, 3200 K AGC 31dB) KP-D20B 1.0 lx (F1.2, 3200 K AGC 31dB)
3 Scanning system	2:1 interlace		
4 Scanning frequency	Hor. NTSC: 15.743 kHz PAL: 15.625 kHz Ver. NTSC: 59.94 Hz PAL: 50 Hz		

11 Scene illumination range

KP-D20A
1.5 to 100,000 lux
KP-D20B
1.0 to 100,000 lux
(when using auto-iris lens)

12 Sensitivity setting

AGC ON/OFF selectable
Max. gain at AGC ON settable
13 White balance
Selectable auto-tracking (ATW),
preset (AWC), MANUAL

14 Electronic shutter lens outputs

Video signal input type lens	Luminance signal 1.0Vp-p/high impedance Power supply 12V DC 60mA
Iris control voltage input (galvanometer) type lens	Coupling coil impedance Damper : 115 Ω ± 10% Drive : 190 Ω ± 10%

15 Backlight compensation

ON/OFF switchable
Sensing area : selectable from 9 areas

16 Electronic shutter speeds

1/60 (1/50 PAL), 1/100 (1/120 PAL),
1/250, 1/500, 1/1000, 1/2000, 1/4000,
1/10000, 1/20000, 1/30000, AES

17 Text display

24 alphanumeric characters

18 Electronic zoom

Up to 4×

19 Lens mount

CS mount

20 Ambient temperature

-10 to +50°C,
30 to 80 %RH

Note: If used continuously, be sure to operate at less than 40°C for long term stable performance.

21 Storage ambient

-20 to +60°C, 30 to 90%RH

22 Power supply

12V ± 10%,

23 Power consumption

Approx 220mA
(including Auto iris lens)

24 External dimensions

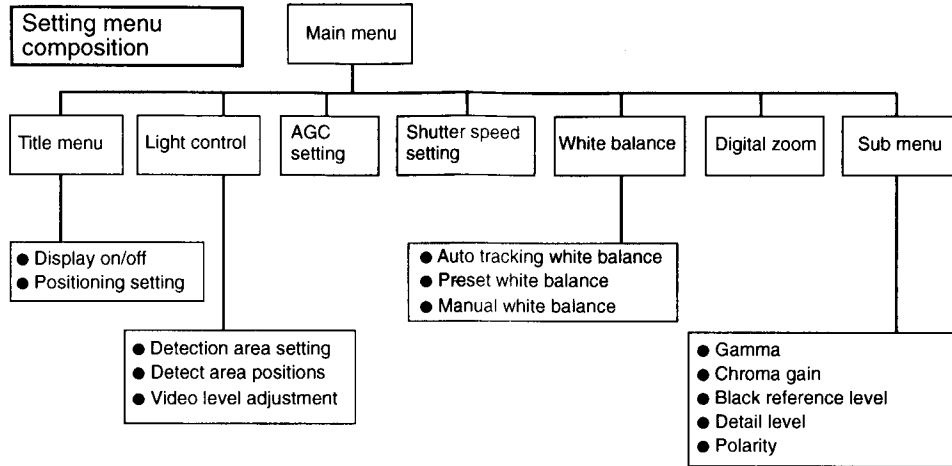
44 (W) × 44 (H) × 49 (D) mm

25 Mass

Approx. 130 g

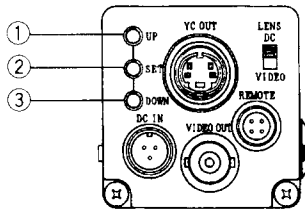
Setting menu description

The camera settings and adjustments can be changed to conform to conditions of use. Use the setting menu indicated on the monitor screen to check and change the settings and adjustments. The setting menu is comprised as follows.



Menu operations

Three rear panel setup buttons are used to shift the cursor and select items from the menus.



- ① **Up button:**
Shift the cursor in the upward direction or increase an adjustment value.
- ② **Set button:**
Press to display the main menu or to change a setting.
- ③ **Down button:**
Shift the cursor in the downward direction or decrease an adjustment value.

- 3) When the Set button is pressed, the selected character is entered in sequence beginning with the left-most of 24 dots shown at the bottom of the screen. Afterwards, each newly selected character is entered sequentially toward the right.

Note:

At the end of character setting, remaining rightward dots are not shown on the monitor screen.

Additional commands of the title input menu are as follows.

Space

To add a blank space, shift the flashing cursor to Space, then press the Set button.

← →

The input characters can be edited by using the arrow symbols.

- 1) Set the flashing cursor to either of the arrow symbols and press Set. The flashing cursor shifts in the arrow direction. Press the Set button repeatedly to where the flashing cursor overlaps the character to be changed.
- 2) Select the character to be inserted with the Up and Down buttons, then press Set to change the character.

Reset

To delete all characters from the display, shift the flashing cursor to Reset, then press Set. After deleting, the flashing cursor returns to the start of the input character select table.

RET

Position the flashing cursor to RET and press Set to exit the title menu and return to the main menu.

End

Shift the cursor to End and press the Set button to close the menu and return to the normal screen.

Title positioning setting

Position:

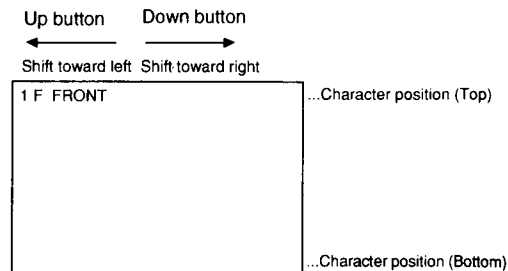
Use when the display position on the screen has been determined.

- 1) Shift the flashing cursor to Position and press Set to open the title position screen indicated in the figure. Screen top and bottom positions are determined respectively by Mode settings Top and Bottom.
- 2) Press the Up and Down buttons to shift the characters horizontally. Afterwards, press Set to confirm the display position and return to the main menu.

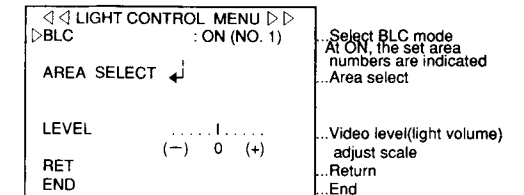
Light control menu

Detection area setting

- 1) Press the Set button for longer than 2 seconds to display the Main menu.
- 2) Use the Up and Down buttons to shift the cursor to Light control; OFF/ON flashes. At ON, the presently set light detect area numbers are displayed. Press the Set button to then open the Light control menu.



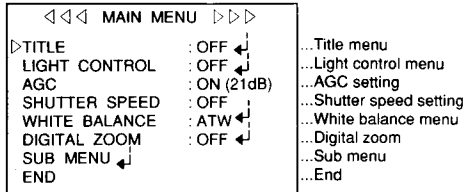
Title positioning screen (Top)



Light control menu

Main menu

1) Press the Set button for at least 2 seconds to display the main menu on the monitor screen.



Main menu

- 2) Check the present settings at the main menu.
- 3) Shift the cursor vertically by pressing the Up and Down buttons, then press the Set button to enable changing the setting of the selected item.
- 4) If changes are unnecessary, shift the cursor to End and press the Set button to return to the normal screen.
- 5) Changed settings are stored in the camera memory (EEPROM) and returned the next time the camera power is switched on.

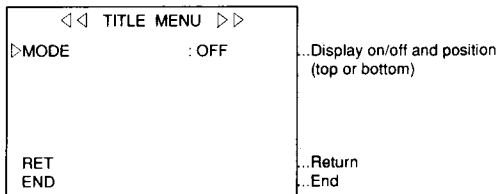
When an item indicated by a ◀ mark is selected, pressing the Set button shifts to the next menu.

Note:
If no button is pressed, the menu display extinguishes automatically after about 5 minutes.

Title menu

One line of up to 24 alphanumeric characters can be displayed on the screen. The display on/off and position are selected at the Title menu.

- 1) Press the Set button for longer than 2 seconds to display the Main menu.
- 2) Use the Up and Down buttons to shift the cursor to Title, then press the Set button to display the Title menu.



Title menu (off mode selected)

- 3) While the cursor is at Mode, press the Set button to shift the mode in the sequence Off, Top, Bottom.

Off

Characters not displayed.

Top

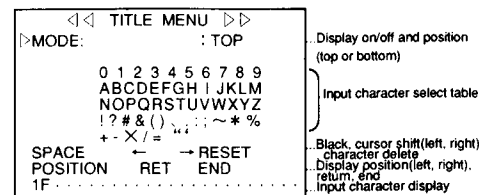
Characters displayed at top of screen.

Bottom

Characters displayed at bottom of screen.

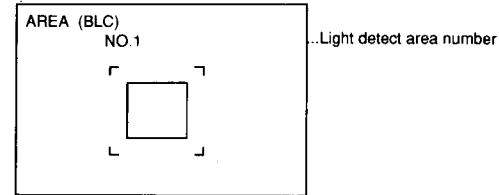
Display character input

- 1) When the mode is Top or Bottom, the characters indicated in the figure can be used.
- 2) Press the Down button, then use the Up and Down buttons to shift the flashing cursor sequentially among the usable characters. Shifting is speeded when the button is held depressed.



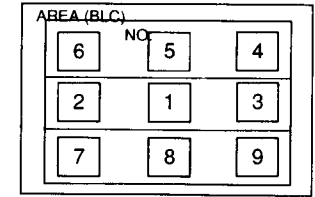
Title menu

- 3) Shift the cursor to BLC and press the Set button to toggle between ON and OFF. When ON, Area Select is displayed.
- 4) Shift the cursor to Area Select and press the Set button to display the detection area select menu.



Detect area indication (no. 1)

Down button: 9 → 8 → 7 → 6 → 5 → 4 → 3 → 2 → 1
(descending order)



Detect area positions

When using a DC control voltage type lens, the detection area can be selected from 9 locations shown in the figure. If using a video signal type lens, three horizontally adjacent locations (indicated by dotted lines in the figure) can be selected (any number in a horizontal group can be chosen).

- 5) There are 9 light detect areas selected by the Up and Down buttons. Select the areas from nos. 1 to 9 that include the subject of main interest.

Up button : 1 → 2 → 3 → 4 → 5 → 6 → 7 → 8 → 9
(ascending order)

Down button: 9 → 8 → 7 → 6 → 5 → 4 → 3 → 2 → 1
(descending order)

- 6) After deciding the detection areas, press the Set button to return to the light control menu.

Back light compensation

The lens iris closes in response to strong light (such as from a spotlight or window) entering the scene background to darken the subject of interest.

When using a DC type lens, set BLC to ON to open the lens iris and avoid blacking out the subject of interest (set the detect areas to match the subject).

The factory setting is OFF.

Note:

When using a video signal type lens, the back light compensation is fixed, regardless of the setting.

Video level adjustment

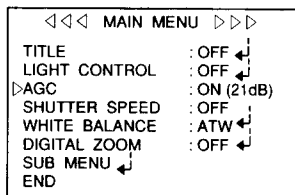
The optimum video level is set at the factory. If necessary, the level can be changed as follows.

- 1) Use the Up and Down buttons to shift the cursor to Level, then press the Set button. The adjustment scale at the right of Level flashes.
- 2) Change the video level by pressing the Up and Down buttons. Holding a button depressed speeds the cursor shift.
- 3) Press the Set button to confirm the setting.
- 4) Return the initial (central) setting by simultaneously pressing the Up and Down buttons for two seconds.

When using a video signal type lens, setting the lens switch to Video extinguishes the scale and fixes the level to the factory setting. To adjust the video level, refer to the lens instructions and adjust the lens sensitivity.

AGC setting

- 1) Press the Set button for longer than 2 seconds to display the Main menu.
- 2) Use the Up and Down buttons to shift the cursor to AGC; the AGC setting flashes. Then press Set to change the maximum gain.
OFF → ON(6 dB) → ON(12 dB) → ON(21 dB) → ON(31 dB)
Numerals indicate the maximum gain. The factory setting is ON (21 dB). When AGC is ON and the scene darkens to where the iris of an auto iris lens is fully open, the circuit gain is automatically increased within the maximum range to obtain a suitable video level.



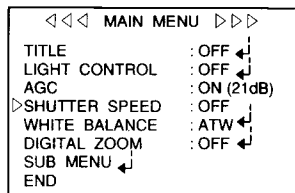
Main menu

Note:

When the AGC is ON, although the sensitivity is raised as the scene darkens, video noise can become apparent. At ON (31 dB), if the maximum gain is raised more than necessary, the video noise can become obtrusive. In this case, reduce the maximum setting. If noise is still objectionable, adjust the Level at the Light control menu.

Shutter speed setting

- 1) Press the Set button for longer than 2 seconds to display the Main menu.
- 2) Use the Up and Down buttons to shift the cursor to Shutter speed; the shutter speed setting flashes.
- 3) Press the Set button to select the speed sequentially in the following order.
OFF → (1/60) → 1/100 → 1/250 → 1/500 → 1/1000 → 1/2000 → 1/4000 → 1/10000 → 1/20000 → 1/30000 → AES
The factory setting is OFF (1/60 second).



Main menu

Auto electronic shutter (AES)

This function adjusts the light amount using only the CCD shutter. Use this function with a fixed iris lens. If using a DC type lens, fix the iris at fully open. The AES function cannot be set with a video signal type lens.

Note:

In the following types of cases, use a different shutter speed. Strong light enters the scene, such as from a spotlight or window.

Strong smear or blooming occurs in the scene.

Screen flicker or coloration occurs.

Color Temperature and white balance adjustment

Color temperature is one of the properties of light. The unit is Kelvin (K), with 0 K equivalent to -273°C.

The color temperature of a light source is related to the type of illumination and sky conditions. It is not directly related to brightness. A high color temperature is bluish, while a low color temperature is reddish.

Since the response of the human eye is adaptive, changes in color are not sensed even with changes in ambient illumination. However, a camera reproduces color temperature differences to result in different color appearance compared to direct viewing by eye. White balance adjustment serves to compensate for these differences in color temperature.

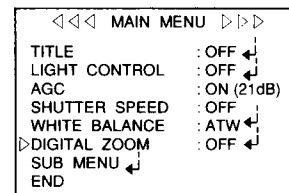
This camera is provided with automatic tracking white balance (ATW ON) mode. The factory setting is ATW ON.

Color temperature, illumination and sky conditions

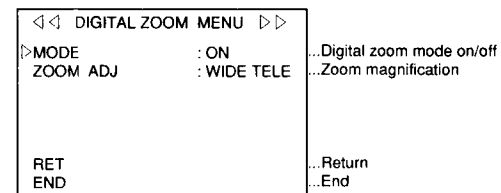
Color temperature (K)	Sky conditions	Illumination
10,000	Clear blue sky	Xenon arc
8,000	Twilight	
7,000	Cloudy sky	
5,000	Bright rain	Fluorescent lamp
	Daylight	
	Midday sunlight	
4,000	2 hours after sunrise	Halogen lamp, Iodine lamp 100 W to 500 W gas filled bulb 100 W tungsten lamp 60 W tungsten lamp
3,000	Around sunrise	
2,000		

Digital zoom

- 1) Press the Set button for longer than 2 seconds to display the Main menu.
- 2) Shift the cursor to Digital Zoom and press the Set button to open the digital zoom menu.



Main menu



Digital zoom menu

- 3) Shift the cursor to Mode and press the Set button to toggle between on and off. At OFF (factory setting), the zoom magnification is fixed at 1. In the ON mode, Zoom Adj is displayed and indicates the previously set zoom magnification.
- 4) To change the zoom magnification, set the mode to ON. Shift the cursor with the Up and Down buttons to Zoom Adj and press the Set button.
- 5) Wide and Tele flash. Change the zoom magnification with the Up and Down buttons. Maximum setting is 4 ×.
- 6) Press the Set button to confirm the setting and stop the flashing.

White balance menu

Three methods of white balance control are provided. The appropriate method can be selected according to conditions of use.

- 1) Press the Set button for longer than 2 seconds to display the Main menu.
- 2) Shift the cursor to White Balance and press Set to open the white balance menu.
- 3) Press Set to select the mode in the sequence ATW - AWC - MANUAL.

ATW (auto tracking white balance)

Factory setting, suitable for automatically tracking the color temperature in the range of 2500 to 8000 K.

◀◀ WHITE BALANCE MENU ▶▶	
▶MODE	: ATW
...Select white balance mode for ATW, AWC or Manual	
RET	...Return
END	...End

White balance menu (ATW)

Note:

ATW does not function properly in the following types of situations. In such cases, use Manual adjustment. Most of the scene is one color, with very little white. Under sodium or other special types of lighting. Background is red or blue.

AWC (preset white balance)

- 1) When AWC is selected, SET AWC flashes.

◀◀ WHITE BALANCE MENU ▶▶	
▶MODE	: AWC
SET AWC	...Flashes during AWC operation
RET	...Return
END	...End

White balance menu (AWC)

- 2) Under the illumination used at the installation site, pickup the color white. Press the Down button to begin automatic white balance adjustment. When completed, SET AWC extinguishes. The automatic process takes several seconds, but if more than 10 seconds elapse, rearrange the scene so that white occupies more of the screen area and repeat the adjustment.

Manual

- 1) Select the Manual mode to display the red and blue gain adjust scales.

◀◀ WHITE BALANCE MENU ▶▶	
▶MODE	: MANUAL
R-GAIN 1
	(-) 0 (+)
B-GAIN 1
	(-) 0 (+)
RET	...Return
END	...End

White balance menu (Manual)

- 2) Shift the cursor to the scale of the color to be adjusted with the Up and Down buttons.
- 3) Press the Set button; the scale cursor flashes.
- 4) Press the Up and Down buttons to adjust blue gain, then press Set to confirm the gain. Simultaneously press the Up and Down buttons for 2 seconds to return the initial (center) setting.
- 5) After adjusting, press the Set button; RET flashes. Again press the Set button to return to the main menu.

Note:

The digital zoom function uses the internal memory to enlarge the image without utilizing a zoom lens. The picture quality deteriorates as the magnification increases. There may also be a change in video level. The function is not suitable for a video signal type auto iris lens. Use the digital zoom with a fixed or DC voltage type lens.

Sub menu

The sub menu is used for changing the picture quality (video response) of the camera output image.

- 1) Press the Set button for longer than 2 seconds to display the Main menu.
- 2) Shift the cursor to Sub Menu and press the Set button to open the sub menu.

◀◀ SUB MENU ▶▶	
GAMMA	: ON
CHROMA GAIN	: 0 0 0
PEDESTAL	: 0 0 0
DETAIL	: 0 0 0
POLARITY	: POSITIVE
RET	...Return
END	...End

Sub menu

Gamma

Shift the cursor with the Up and Down buttons to Gamma, then press the Set button to toggle on/off.

Chroma gain

The optimum color level has been set at the factory. If necessary, this can be changed as follows.

- 1) Shift the cursor to Chroma Gain with the Up and Down buttons and press the Set button; the numerals flash.
- 2) Press the Up and Down buttons to change the level (-120 to 000 to +127). Press continuously to speed change. Press the Up and Down buttons simultaneously for 2 seconds to return the initial (000) setting.
- 3) Press the Set button to confirm the setting and stop the flashing.

Pedestal (black reference level) setting

The optimum black reference level has been set at the factory. If necessary, this can be changed as follows.

- 1) Shift the cursor to Pedestal with the Up and Down buttons and press the Set button; the numerals flash.
- 2) Press the Up and Down buttons to change the level (-120 to 000 to +127). Press continuously to speed change.

Press the Up and Down buttons simultaneously for 2 seconds to return the initial (000) setting.

- 3) Press the Set button to confirm the setting and stop the flashing.

Detail level

The optimum detail level has been set at the factory. If necessary, this can be changed as follows.

- 1) Shift the cursor to Detail with the Up and Down buttons and press the Set button; the numerals flash.
- 2) Press the Up and Down buttons to change the level (-120 to 000 to +127). Press continuously to speed change. Press the Up and Down buttons simultaneously for 2 seconds to return the initial (000) setting.
- 3) Press the Set button to confirm the setting and stop the flashing.

Polarity

The factory setting is positive. Shift the cursor to Polarity and press the Set button to toggle between positive and negative. The negative polarity is convenient when using negative material, such as negative film.

Flangeback adjustment

Flangeback adjustment is needed in cases where focus cannot be obtained by normal lens focus operation or focus is lost at the maximum telephoto and wide angle settings of a zoom lens. In such cases, open the lens iris and adjust as follows.

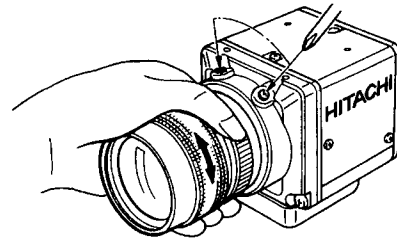
1. Fixed focus lens

Set the lens focus ring to infinity and pickup a camera subject at least 20 meters distant. Loosen the lens mount setscrews (2 screws) and turn the lens and lens mount ring to adjust the focus. After adjusting, tighten the lens mount setscrews.

2. Zoom lens

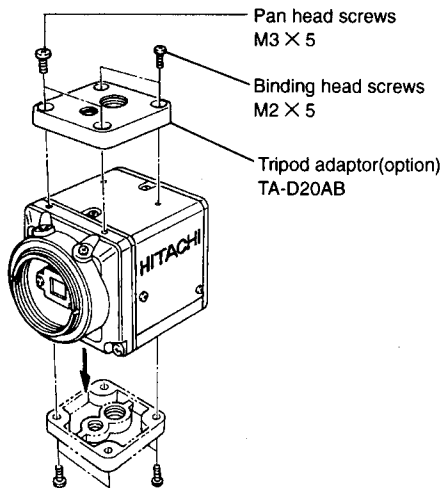
1) Set the lens to maximum telephoto and pickup a camera subject at least 3 meters distant. Loosen the lens mount setscrews (2 screws) and turn the focus ring to adjust the focus while using care not to turn the lens and lens mount ring.

2) Set the lens to maximum wide angle and pickup the same camera subject. While using care not to turn the lens focus ring, turn the lens and lens mount ring to adjust the focus. Repeat these steps until focus is obtained at both telephoto and wide angle settings. After adjusting, tighten the lens mount setscrews.



Camera mounting

As shown in a figure, when attaching in the case where hang on the ceiling etc., attach metallic ornaments and a camera is hung, a tripod, etc., a tripod adaptor (option) is attached.



Caution :Use the following type of camera mounting screw.

Type : 1/4"-20UN
Length L : 3/8"-16UN

If longer than 7 mm, there is risk of internal damage to the camera.
Conversely, if too short, the camera will not be firmly secured and there is risk of dropping.



Supplied accessories

Operation manual : 1set

Option accessories

C mount adaptor : LA-D20AB
Tripod adaptor : TA-D20AB
DC input plug : R03-P3F
Lens plug : E4-191J-100
Remote plug : HR10A-7P-4P (01)
Lenses : Refer to attached sheet

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