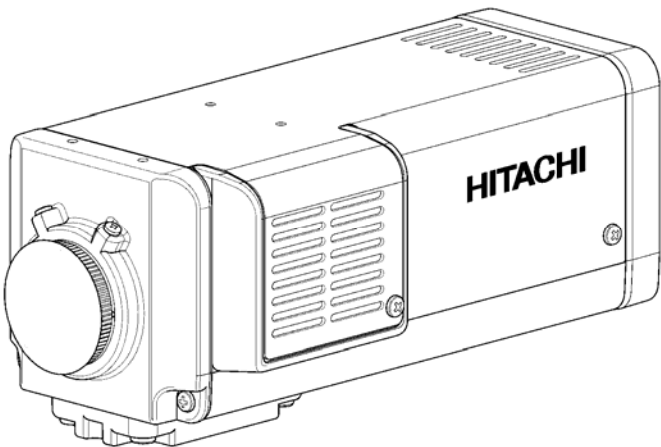## CCD Camera

KP-DE500
KP-E500

Operation manual

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.

Table of contents

General

The KP-DE500 is an ultra high sensitivity color camera that utilizes the electron multiplication type CCD (EM-CCD) image sensor.

The KP-E500 is an ultra high sensitivity camera that utilizes the electron multiplication type CCD (EM-CCD) image sensor.

Features

Ultra high sensitivity
Ultra high sensitivity is possible due to the electron multiplication (EM) CCD which multiplies the charge on the individual pixels before the charge is converted to a voltage, eliminating noise that would be associated with amplification gain.　Moving images retain the clarity and sharpness even under low light conditions.

High color fidelity
An RGB primary color mosaic filter is used to produce images of high vertical resolution and color fidelity.

New digital signal processor (DSP)
A new Digital Signal Processor (DSP) with improved luminance signal processing and a 5 H enhancer is used to obtain high quality images with a high signal to noise (S/N) ratio.

Various functions
・Auto tracking white balance (ATW)
・Color / Black & White select
・Digital noise reduction (DNR)
・Electric shutter speed
・Electric sensitivity enhance
・Backlight compensation (BLC)
・Text display (character generator)

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℃)
・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 Tight 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℃.
Cleaning
・Use a blower or a lens brush to remove dusts on the lens or the optical filter.
・Wipe dirts on the case off with dry soft cloth. If dirks are hardened, wipe them off with cloth moistened with neutral detergent liquid; wipe the cover with dry cloth.
・Do not use benzine,thinner,alcohol,liquid cleaner or spray-type cleaner.
・In event dust or other　debris　is lodged between the CCD and optical filter, consult dealer for cleaning by an optical technician.

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, and reflected light, etc.) is shot, a blue belt to remain thinly in vertical and the horizontal direction of light might go out.
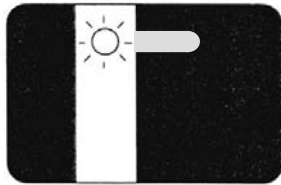
Moreover, the lower side on the monitor screen might become pure-white momentarily.
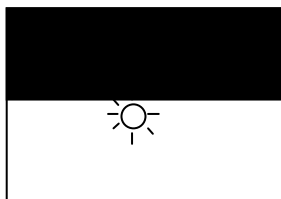
In this case, change the angle of the camera so that such strong light does not enter the camera through the lens.

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.

Ref.No.KV-0139

Declaration of Conformity

Manufacturer's Name:	Hitachi Kokusai Electric, Inc.
Manufacturer's Address:	3-14-20,Higasinakano, Nakano-ku, Tokyo 164-8511, Japan
Representative(s) Address in the EU:	Hitachi Denshi (Europa) GmbH Weiskircher Straße 88, Jügesheim D-63110 Rodgau, Germany
	Hitachi Denshi (U.K.) Ltd. Windsor House, Britannia Road Waltham Cross, Hertfordshire, EN8 7NX United Kingdom

declares, that the product:

Product Name:	CCD Cameras
Model Number(s):	KP-DE500, KP-E500

conforms to the following Standards:

EMC: EN 61000-6-3/2001
EN 61000-6-1/2001

Supplementary Information:
"The product complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC."

Signature:

Y. Yamada
Senior Manager
Quality Assurance Dept. II
Hitachi Kokusai Electric Inc.

M. Katou
Managing Director
Hitachi Denshi (Europa) GmbH
Hitachi Denshi (U.K.) Ltd.

Date: 5th Dec,2005

V3T-0075

Section names and functions

Tripod adaptor holes
See camera mounting
on page 11.

Lens mount screws
See page 10.

Lens mount ring
See flange back adjustment
on page 8.

Lens connector [**LENS**]
Connect lens cable when
using an auto iris lens. See
page 9.

C-mount adaptor
See installation of CS-mount
lens on page 8.

HITACHI

Camera mounting hole
See page 11.

4

Set up buttons [**SETUP**]
Use when setting up and adjusting
the camera with reference to the
screen menu. See page 13.

SET

LENS
─DC

REMOTE   VIDEO

VIDEO

Lens select switch [**LENS**]
Set according to the type of
lens. See page 9.
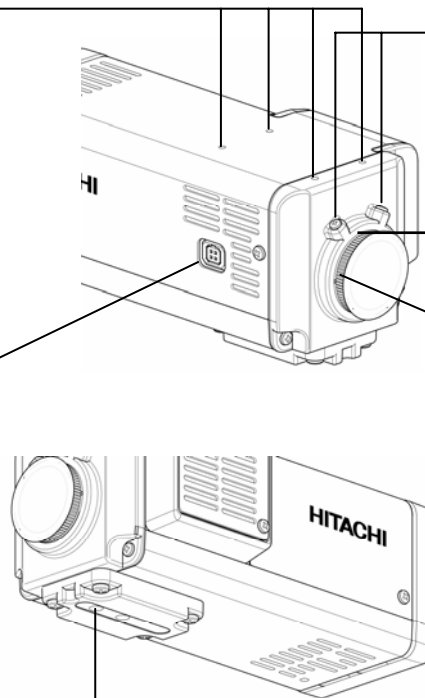
Remote connector
[**REMOTE**]
Use for remote menu
operations. See page 32.

Video output connector [**VIDEO**]
See connections on page 6.

DC input connector
See page 6.

5
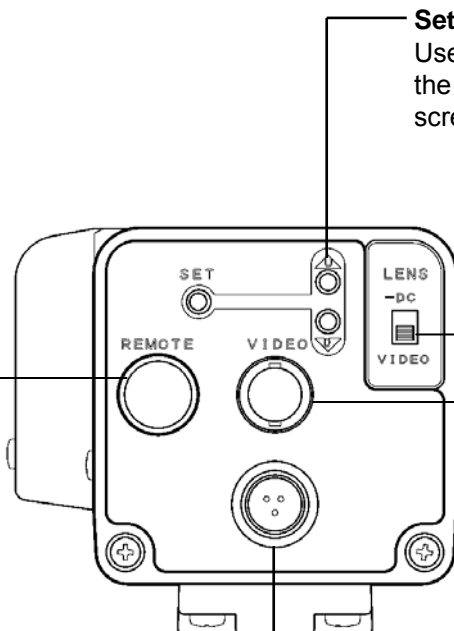
Connections

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 the more monitors, set the 75Ω 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.

3C-2V	・・・・	150m
5C-2V	・・・・	200m
7C-2V	・・・・	300m
10C-2V	・・・・	400m

KP-DE500
KP-E500

75-ohm coaxial cable
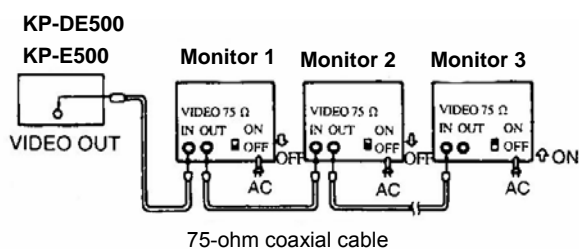
Set the 75Ω switch of only the final monitor to on.
Set the 75Ω switch of other monitors to off.

External power supply connection

Use a stabilized 12 VDC(±10%) power supply rated at 2.5 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.

DC input connector
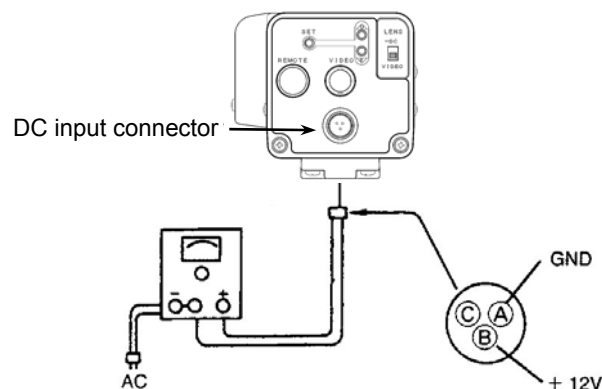
Lens

Recommended lenses

Use an auto iris lens having a plug pin arrangement conforming to EIAJ (Electronic Industries Association of Japan) specifications.
This camera is using a CCD that has sensitivity in infrared region (from 700 to 1000nm).
Please select a lens for use from the following recommendation lens table.

Type		Lens model	Specification			Lens mount	Lens switch
Auto iris	1/2	12VG412ASIR	4.0~12.0	mm	F1.2~360	C-mount	DC
		12VG1040ASIR	10.0~40.0	mm	F1.4~360	C-mount	
		DV5×3.6R4B-SA2	3.6~18.0	mm	F1.8~360	CS-mount	
		HG3Z4512FCS-IR	4.5~12.5	mm	F1.2~360	CS-mount	

NOTE
If another type of lens is used, it may detract from camera performance or there may be difficulty is attaching the lens.
When procuring, be sure to specify the EIAJ compatible plug.

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.

A

C-mount lens: Less than 4.1mm
CS-mount lens: Less than 4.1mm

Lens

Lens flange surface
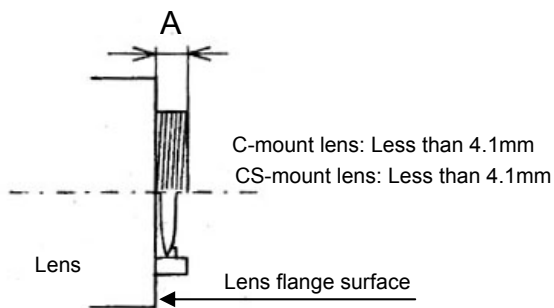
Installation of CS-mount lens

C-mount adaptor is provided for the camera in the factory.

When using a CS-mount lens, unscrew and remove the
C-mount adaptor. Save the C-mount adaptor for possible future.
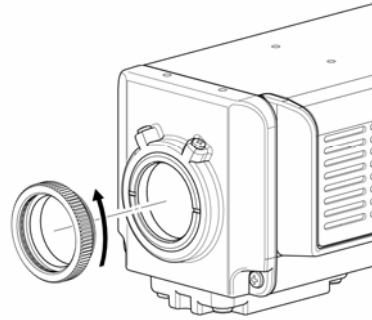
Lens selector switch

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.

NOTE

1) To the extent possible, set the lens response to
    Average. Hunting can occur toward the Peak setting.

2) When adjusting the level, choose a location with
    adequate brightness (more than 300 lux) where the
    AGC and Sens Up functions are not needed.

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
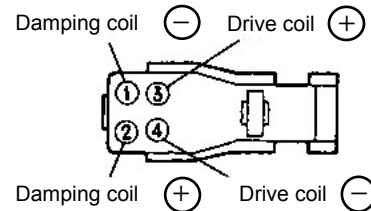
Video type lens
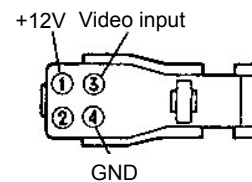
After installing the plug on the cable, connect it to the lens
connector on the rear of the camera.

....

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.

Fixed focus lens

1) Set the lens focus ring to infinity.

2) Aim toward an object at least 20 meters distant.

3) Loosen the (2) lens mount screws and turn the lens mount
    ring to adjust the focus.   Use care not to disturb the lens
    focus ring.

4) Tighten the lens mount screws.

NOTE

If using an auto iris lens and the adjustment object distance
is less than several meters, due to lens depth of focus
relationship, slight blurring can occur at certain iris positions.
In this event, darken the scene so as to open the iris and
adjust the focus or flangeback to prevent the blurring.

Zoom lens

1) Set the lens to telephoto and aim toward an object at least
    20 meters distant.

2) Turn the lens focus ring to adjust the focus.

3) Set the lens to wide angle.   Loosen the (2) lens mount
    screws and turn the lens mount ring to adjust the focus.
    Use care not to disturb the lens focus ring.

4) Again set to telephoto but adjust the focus by turning the
    Lens focus ring.

5) Repeat these steps and carefully adjust for best focus.

6) Finally, tighten the lens mount screws.
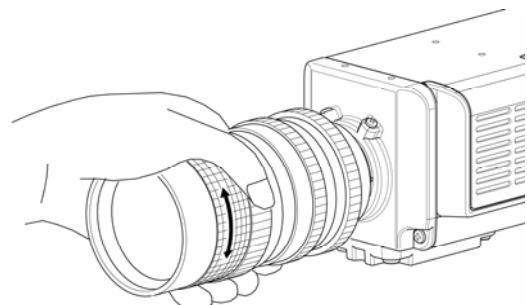
Camera mounting

If the camera is to be suspended from the ceiling, change the position of the tripod adaptor from the bottom to the top of the camera, as indicated in the figure.

Tripod adaptor

Binding head screws M3 x 8
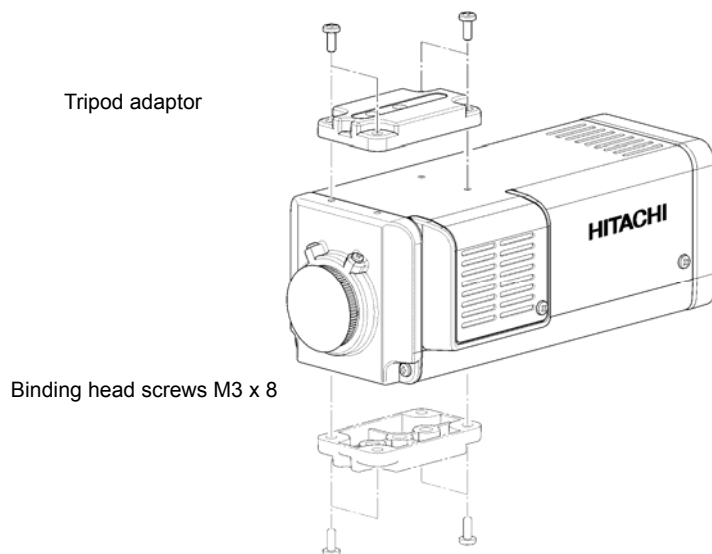
Caution:

Use the following type of camera mounting screw.

Type :U 1/4-20
Length:L=7mm
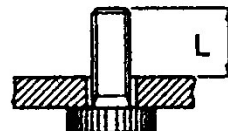
If longer than 7 mm, there is risk of internal damage to the camera. Conversely, if too short, the camera will not be firmly secured and there is risk of dropping.

Setting menu description

The camera setting 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.

Setting menu composition

Main Menu (page 13)

Camera Title Menu (page 14) ········ · Display character setting
· Display position setting

Light Control Menu (page 16) ········ · Light control mode setting
· Video level adjustment, etc.

AGC Menu (page 19) ········ · AGC mode setting
· Fixed and limit gain setting

Shutter Speed setting (page 21)

Sensitivity enhance setting (page 22)

Color-B/W selection (page 23) **(*)**

· WB mode setting
· WB detection area setting
· Manual R/B gain adjustments, etc

White Balance Menu (page 25) **(*)**

Sub Menu (page 29) ········

· Gamma
· Chroma gain adjustment
· Black reference level adjustment
· Detail adjustment
· Polarity
· Digital noise reduction
· Burst signal
· Camera reset

(*) Note: Only KP-DE500

Menu operations

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

SET
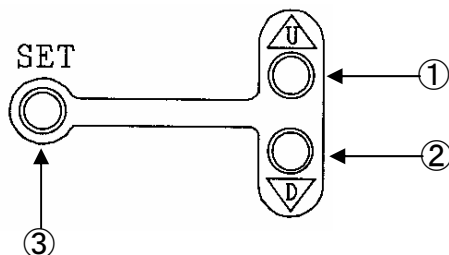
① Up button : Shift the cursor in the upward direction or increase an adjustment value.

② Down button : Shift the cursor in the downward direction or decrease an adjustment value.

③ Set button : Press to display the main menu or to change a setting.

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

Main Menu

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

```
◆◆ MAIN MENU ◆◆

▷CAMERA TITLE :OFF ↵
  LIGHT CONTROL:OFF ↵
  AGC          :ON ↵
  SHUTTER SPEED:OFF
  SENS UP      :OFF
  B/W MODE     :OFF
  WHITE BALANCE:ATW ↵
  SUB MENU ↵
  END
```

······ Camera title setting menu
······ Light control setting menu
······ AGC setting menu
······ Shutter speed setting
······ Sensitivity enhance Setting
······ B/W mode setting (*)
······ White balance mode setting menu (*)
······ Sub menu
······ End of menu display

MAIN MENU

(*) Note: KP-E500 is not displayed.

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) When an item indicated by a ↵ mark is selected, pressing the SET button shifts to the next menu.

Camera Title Menu

One line of up to 22 alphanumeric characters can be displayed on the screen. The display on/off and position are selected at the camera 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 "CAMERA TITLE", then press the SET button to display the camera title menu.

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. (Factory setting)
TOP : Characters displayed at top of screen.
BOTTOM : Characters displayed at bottom of screen.

```
◆ CAMERA TITLE MENU ◆

▷MODE     :OFF




  RET
  END
```

······ Display On/OFF and position (OFF / TOP / BOTTOM)

······ Return to the main menu
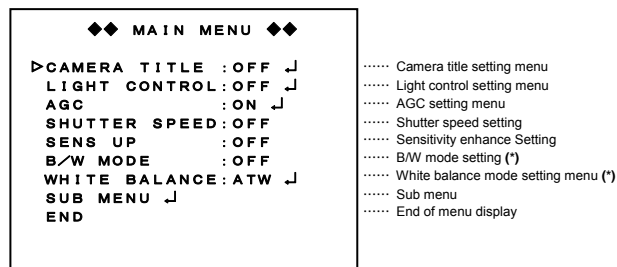······ End of menu display
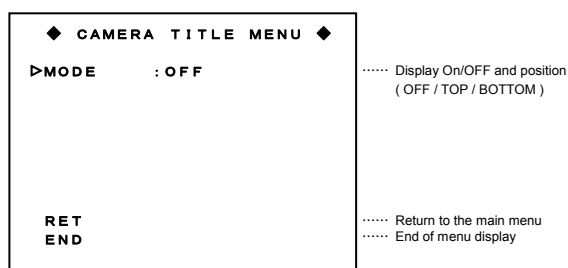
CAMERA TITLE MENU (MODE: OFF)

Display character input

1) When the mode is Top or Bottom, the characters indicated in the figure can be used.

```
◆ CAMERA TITLE MENU ◆

▷MODE        :TOP
  0123456789
  ABCDEFGHIJKLM
  NOPQRSTUVWXYZ
  !?#&(),.:;~*%
  +−x/= "'

  SPACE    ←   →   RESET
  POSITION RET   END
  CAMERA  NO. 1···········
```

······ Display On/OFF and position (OFF / TOP / BOTTOM)
} Input character select table
······ Blank, cursor shift (left / right), character delete
······ Display position, return, end
······ Input character display
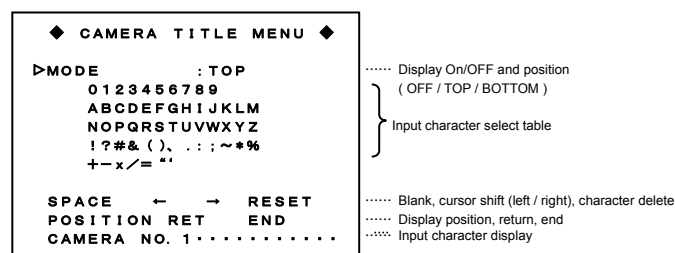
CAMERA TITLE MENU (MODE: TOP or BOTTOM)

2) Press the DOWN button, then use the UP and DOWN buttons to shift the flashing cursor sequentially among the usable characters.

3) When the SET button is pressed, the selected character is entered in sequence beginning with the left-most of 22 dots shown at the bottom of the screen.
Afterwards, each newly selected character is entered sequentially toward the right.

The item under character input selecting department uses it in the following manner.

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 button. 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 "CAMERA 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.

Title positioning screen (Top)

Light Control Menu

Light control mode 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", then press the SET button to display the light control menu.

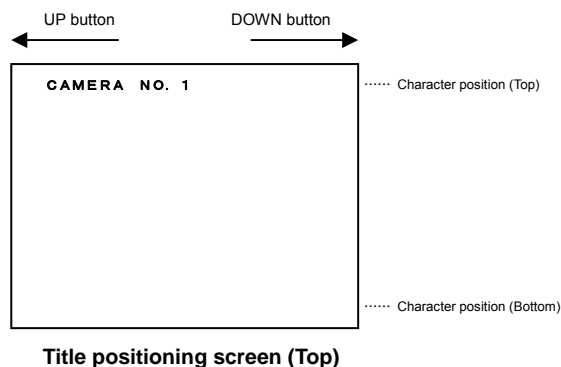3) While the cursor is at "MODE", press the SET button to shift the mode in the sequence "AVERAGE", "BLC", "PEAK/AVE".

AVERAGE : Responds to the average lighting over a broad area. (Factory setting)

BLC : Exposure is controlled only by the luminosity level of specific area. (Scanning area is selectable from 9 area.)

PEAK/AVE : The peak level and the average level are used together and exposure is controlled. (The ratio of a peak value and average value is changeable.)
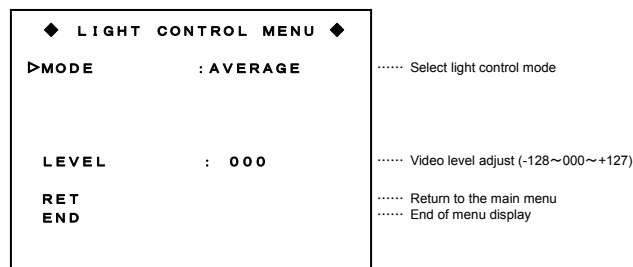
LIGHT CONTROL MENU (MODE: AVERAGE)

Video level adjustment

The optimum video level is set at the factory (factory setting is "000"). 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 value at the right of Level flashes.

2) Change the video level by pressing the UP and DOWN buttons. (Variable range: -128～000～+127)

3) Return the factory setting(000) by simultaneously pressing the UP and DOWN buttons for two seconds.

4) Press the SET button to confirm the setting and the cursor migrates to "RET".

Note
For video level adjustment on lenses that use the video signal type lens iris, please refer to the user's manual of the lens.

NOTE

The video level adjustment for lenses that use a video signal type lens, is adjusted using the binding screws on the side of the lens as shown in the method below.

1) The lens side sensitivity binding adjustment gauge is displayed on the light control menu, when the LENS SW on the camera back is set to [VIDEO].

```
◆ LIGHT CONTROL MENU ◆

▷MODE        : AVERAGE          ······ Select light control mode

         L        ●        v     ······ Video output level gauge
||||||||||||||||||||||||||||||||||||||||··  ······ Control reference level gauge
······················               ······ Video level adjust (-128～000～+127)
         R        ●        f
||||||||||||||||||||||||||||||||||||||||···
······················               ······ Return to the main menu
                                     ······ End of menu display
 LEVEL        : 000
```

LIGHT CONTROL MENU (MODE: AVERAGE)

2) Please do the sensitivity binding on the side of the Lens so that the value of video output level gauge [Lev] does not drop from the value of reference level gauge [Ref].

3) When the value of [Lev] is adjusted to a lower value than the value of [Ref] the repetition phenomenon (hunting) of the lens iris may occur along automatic gain control in the camera.

Setting of BLC

In the case where there is a strong light source and sunlight in the background, the lens iris will close according to the scene brightness, causing the desired object in the scene to appear dark. This mode is used under such a condition.
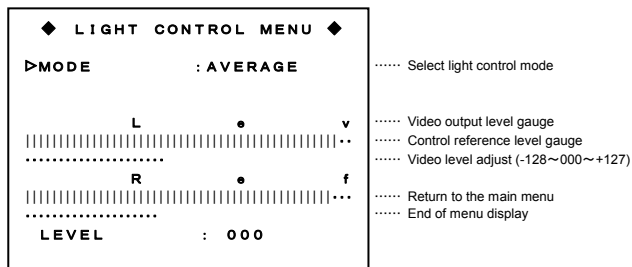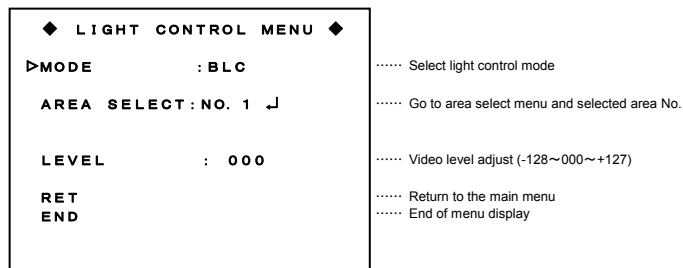
4) Press the SET button for longer than 2 seconds to display the main menu.

5) Use the UP and DOWN buttons to shift the cursor to "LIGHT CONTROL", then press the SET button to display the light control menu.

6) The following menu is displayed.   Push the SET button to select "BLC", when the cursor is in "MODE".

```
◆ LIGHT CONTROL MENU ◆

▷MODE        : BLC              ······ Select light control mode

 AREA SELECT: NO. 1 ↵           ······ Go to area select menu and selected area No.

 LEVEL        : 000             ······ Video level adjust (-128～000～+127)

 RET                           ······ Return to the main menu
 END                           ······ End of menu display
```

LIGHT CONTROL MENU (MODE: BLC)

7) Shift the cursor to "AREA SELECT" and push the SET button to display the detection area(BLC) select menu.

```
AREA (BLC)
     NO. 1
```

Detect area position

```
┌───┬───┬───┐
│ 6 │ 5 │ 4 │
├───┼───┼───┤
│ 2 │ 1 │ 3 │
├───┼───┼───┤
│ 7 │ 8 │ 9 │
└───┴───┴───┘
```

DETECTTION AREA (BLC) SELECT MENU

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. (Factory setting is NO.1)

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 area, push the SET button to return to the light control menu.

Setting of PEAK/AVERAGE

When there is strong spot light in the background a halo may appear and cause obstruction to a desired object in the image. This mode is used under such a condition.

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", then press the SET button to display the light control menu.

3) The following menu is displayed, push the SET button and change to "PEAK/AVE", when the cursor is in "MODE".

```
◆ LIGHT CONTROL MENU ◆

 MODE        : PEAK/AVE         ······ Select light control mode

▷PK/AV       : 15/ 85           ······ Select peak / average value ratio

 LEVEL        : 000             ······ Video level adjust (-128～000～+127)

 RET                           ······ Return to the main menu
 END                           ······ End of menu display
```
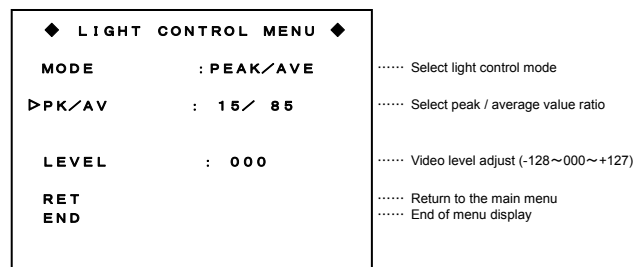
LIGHT CONTROL MENU (MODE: PEAK/AVE)

4) Shift the cursor to "PK/AV" and push the SET button, peak / average ratio value changes. As the peak value is enlarged It reacts to spot light. Factory setting is "15/85".

SET button : **15/ 85→30/ 70→50/ 50→75/ 25→100/ 0**

> **NOTE**
> As the peak value increases the hunting phenomenon of the lens reacting to the video level may cause flickering resulting in changes of brightness in the image.

AGC Menu

Setting AGC mode

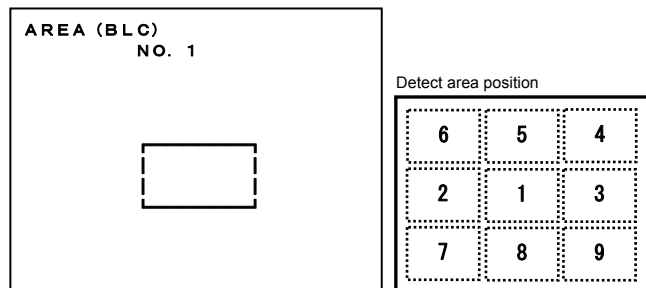1) Press the SET button for longer than 2 seconds to display the "MAIN MENU".

2) Use the UP and DOWN buttons to shift the cursor to "AGC", then press the SET button to display the "AGC MENU".

```
    ◆  AGC  MENU  ◆

▷MODE          : ON          ······ Select AGC mode

 AGC  LIMIT    : 250         ······ Limit gain (155～250)



 RET                         ······ Return to the main menu
 END                         ······ End of menu display
```

AGC MENU (MODE: ON)

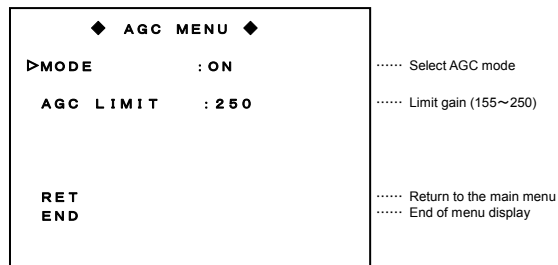3) While the cursor is at "MODE", press the SET button to shift the mode in the sequence "ON", "OFF".

ON : The video output level is controlled automatically to a proper value within the range of "AGC LIMIT" according to brightness. (Factory setting)

OFF : "FIX. GAIN" mode that does not change, according to light level.

Setting AGC LIMIT (AGC ON)

1) Use the UP and DOWN buttons to shift the cursor to "AGC LIMIT", then press the SET button. The adjustment value at the right of value flashes.

2) Change the "AGC LIMIT" by pressing the UP and DOWN buttons. (Variable range: 155～250)

3) Return to the factory setting(250) by simultaneously pressing the UP and DOWN buttons for two seconds.

4) Press the SET button to confirm the setting and the cursor shifts to "RET".

Setting FIX. GAIN (AGC OFF)

```
    ◆  AGC  MENU  ◆

 MODE          : OFF         ······ Select AGC mode

▷FIX.  GAIN    : 000         ······ Fix. Gain (000～250)



 RET                         ······ Return to the main menu
 END                         ······ End of menu display
```
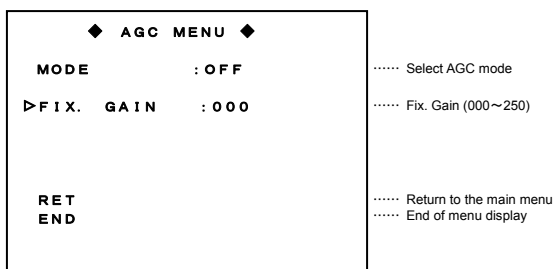
AGC MENU (MODE: OFF)

1) Use the UP and DOWN buttons to shift the cursor to "FIX. GAIN", then press the SET button. The adjustment value at the right of value flashes.

2) Change the "FIX. GAIN" by pressing the UP and DOWN buttons. (Variable range: 000～250)

3) Return to the factory setting(000) by simultaneously pressing the UP and DOWN buttons for two seconds.

4) Press the SET button to confirm the setting and the cursor shifts to "RET".

> **NOTE**
> The noise in the image may be conspicuous when high levels of amplification are used.

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.

   SET button:
   OFF(1/60)→1/100→1/250→1/500→1/1000→1/2000→AES

   The factory setting is OFF (1/60 second).

```
     ◆◆  MAIN MENU  ◆◆

▷CAMERA  TITLE  : OFF  ↵        ······ Camera title setting menu
 LIGHT  CONTROL : OFF  ↵        ······ Light control setting menu
 AGC            : ON   ↵        ······ AGC setting menu
 SHUTTER  SPEED : OFF           ······ Shutter speed setting
 SENS  UP       : OFF           ······ Sensitivity enhance Setting
 B/W  MODE      : OFF           ······ B/W mode setting (*)
 WHITE  BALANCE : ATW  ↵        ······ White balance mode setting menu (*)
 SUB  MENU  ↵                   ······ Sub menu
 END                            ······ End of menu display
```

(*) Note: KP-E500 is not displayed.

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.

NOTE

1) If using a DC type lens, fix the iris at fully open.

2) The AES function cannot be set with a video signal type lens.

3) 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.

Sensitivity enhance setting (SENS UP)

The present camera includes a sensitivity enhancement function that increases the CCD exposure time and interpolates the image with an image stored in memory to effectively boost the sensitivity.

1) Press the SET button for longer than 2 seconds to display the "MAIN MENU".

```
     ◆◆  MAIN MENU  ◆◆

▷CAMERA  TITLE  : OFF  ↵        ······ Camera title setting menu
 LIGHT  CONTROL : OFF  ↵        ······ Light control setting menu
 AGC            : ON   ↵        ······ AGC setting menu
 SHUTTER  SPEED : OFF           ······ Shutter speed setting
 SENS  UP       : OFF           ······ Sensitivity enhance Setting
 B/W  MODE      : OFF           ······ B/W mode setting (*)
 WHITE  BALANCE : ATW  ↵        ······ White balance mode setting menu (*)
 SUB  MENU  ↵                   ······ Sub menu
 END                            ······ End of menu display
```

(*) Note: KP-E500 is not displayed.

MAIN MENU

2) Use the UP and DOWN buttons to shift the cursor to "SENS UP" ; the setting flashes.

3) Press the SET button to select the setting sequentially in the following order.

   SET button: **OFF→AUTO x2→AUTO x4→AUTO x6→ AUTO x8→AUTO x10→AUTO x12→AUTO x16→ AUTO x32→AUTO x64→OFF→MANU x2→MANU x4 →MANU x6→MAN x8→MANU x10→MANU x12→ MANU x16→MANU x32→MANU x64→MANU x88→ MANU x128**

OFF : Sensitivity enhance function not used; factory setting.

AUTO : As the scene darkens, the sensitivity is automatically enhanced by the selected multiple. Best mode for day/night continuous surveillance.

MANU : Mode for fixed sensitivity boost. When AGC is ON, fixed at maximum gain.

The setting state of SENS UP and SHUTTER SPEED

		SENS UP setting		
		OFF	**AUTO**	**MANU**
SHUTTER SPEED	**1/60**	**OFF**	**OFF**	**OFF**
	1/100	**1/100**	**→OFF**	**1/100**
	1/125 | 1/2000	**1/125 | 1/2000**	**→OFF**	**→OFF**
	AES	**AES**	**AES**	**→OFF**

1) When SENS UP setting is Manual, the shutter speed setting is ineffective (off).

2) At SENS UP Auto, the shutter speed setting is as follows.
   ・ Shutter speed is 1/100 or effective during AES.
   ・ Shutter speed is 1/100 and ineffective (off) in modes other AES.

NOTE
1) Enhanced sensitivity can cause blurring of moving images.

2) In the following types of cases, reduce the sensitivity multiple.

　・ Noise increases at high sensitivity and further increases at high frequency.

　・ The Shutter speed cannot be changed during Auto and Manual SENS UP settings. Temporarily set SENS UP to OFF when changing the Shutter speed.

　・ White flaws may become apparent at high sensitivity, but these are not due to malfunction.

Raising sensitivity by color-B/W selection [Only KP-DE500 type]

1) Press the SET button for longer than 2 seconds to display the "MAIN MENU".

```
     ◆◆  MAIN MENU  ◆◆

 ▷CAMERA  TITLE  : OFF  ↵      ······ Camera title setting menu
  LIGHT  CONTROL : OFF  ↵      ······ Light control setting menu
  AGC            : ON   ↵      ······ AGC setting menu
  SHUTTER  SPEED : OFF         ······ Shutter speed setting
  SENS  UP       : OFF         ······ Sensitivity enhance Setting
  B/W  MODE      : OFF         ······ B/W mode setting (*)
  WHITE  BALANCE : ATW  ↵      ······ White balance mode setting menu (*)
  SUB  MENU  ↵                 ······ Sub menu
  END                          ······ End of menu display
```

(*) Note: KP-E500 is not displayed.

MAIN MENU

2) Use the UP and DOWN buttons to shift the cursor to "B/W MODE" ; the setting flashes.

3) Press the SET button to select the setting sequentially in the following order.

SET button: **OFF→ON→AUTO(H)→AUTO(M)→AUTO(L)**

OFF : Color always mode; factory setting.
ON　: B/W always mode

AUTO　: Changes to the color image and B/W image automatically according to brightness.

1) The character of the rest of "AUTO" is showing the brightness (the image level) where the mode changes from color to a B/W image.

AUTO(H)　: About 70% or less of proper levels
AUTO(M)　: About 50% or less of proper levels
AUTO(L)　: About 30% or less of proper levels

2) Change is using the scale factor data of the amplification data or SENS UP of automatic gain control for the color image from a B/W image. AGC setting is "OFF" or SENS UP setting is "OFF" / "MANU" are not able to use the "AUTO" setting of BW MODE.

About B/W mode
The camera CCD responds to infrared light (From 700nm to 1000nm) that is invisible to the human eye.
The normal color mode uses an IR cut filter to remove the infrared component.
Sensitivity is usually more important in the B/W mode.
Therefore, the IR cut filter is removed to take advantage of sensitivity in the infrared region.

NOTE
1) In the case that near infrared lighting is used the hunting phenomenon causing repeated changes between the color and B/W mode may occur. Avoid strong near Infrared lighting when using the AUTO Mode.

2) When the mode is changed to a B/W image where there is no near infrared light a change in sensitivity does not occur.

3) The focus face of the lens differs in visible light (the color image) and near infrared (the B/W image).
The focus has deviated when the mode is changed to a B/W image even if the focus was set properly for the color image. Please use a lens having near infrared response when using the B/W mode.

4) "AGC LIMIT" binds B/W mode AUTO to (H) or (M) at the time of, "220" or more binding.

White Balance Menu [Only KP-DE500 type]

Setting White Balance mode

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 "WHITE BALANCE", then press the SET button to display the "WHITE BALANCE MENU". But, it does not move to "WHITE BALANCE MENU" at the time of B/W image condition by B/W MODE setting.

```
◆ WHITE BALANCE MENU ◆

▷MODE           : ATW          ······ Select White Balance mode

ATW RANGE       : NORMAL        ······ ATW Range setting
WB AREA         : OFF           ······ Select WB area mode


RET                            ······ Return to the main menu
END                            ······ End of menu display
```
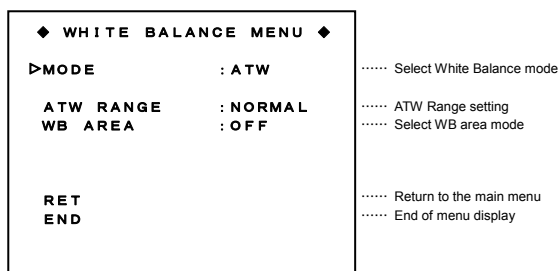
WHITE BALANCE MENU (MODE: ATW)

3) While the cursor is at "MODE", press the SET button to shift the mode in the sequence "ATW", "AWC" and "MANUAL". Factory setting is "ATW".

・**ATW (auto tracking white balance)**

Ordinarily use this mode, which is suitable for lighting color temperature from 2,500K to 8,000K.

Setting ATW Range (Color temperature flattery range)

1) Use the UP and DOWN buttons to shift the cursor to "ATW RANGE".

2) Press the SET button to shift the mode in the sequence "NORMAL", "SPECIAL". Factory setting is "NORMAL".

|	
NORMAL	: From 2,500K to 8,000K
SPECAIL	: From 2,500K to 8,000K, and special lighting such as the mercury lamp and sodium vapor lamp

---
NOTE

1) Please set "ATW RANGE" to the "SPECIAL" mode when you use sodium lighting. The color distinction becomes possible though the white balance may not be completely suitable.

2) White balance cannot be fully adjusted in the following situations.
   ・ Most of the scene is a single color or there is very little white component.
   ・ Background is red or blue.

Setting WB detection area

1) Use the UP and DOWN buttons to shift the cursor to "WB AREA".

2) Press the SET button to shift the mode in the sequence "OFF", "ON(NO.*)". [*1〜9] Factory setting is "OFF".
OFF	: **A**ll the screens
ON(NO.*) [*1〜9]	: Only the selection area

3) When the display is turned "ON(NO.*), "AREA SELECT" is displayed in the line in the under.

4) Shift the cursor to "AREA SELECT" and push the SET button to display the detection area(WB) select menu.

```
AREA (WB)
       NO. 1


      ┌ ─ ┐
      │   │
      └ ─ ┘
```

Detect area position

6	5	4
2	1	3
7	8	9
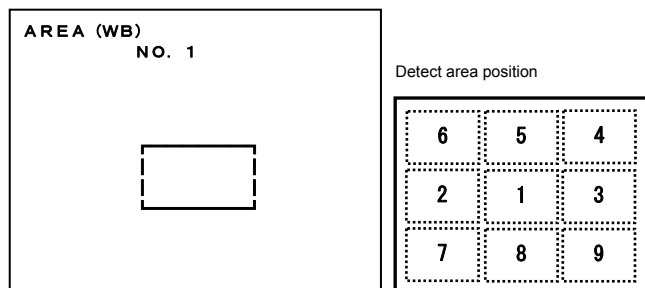
DETECTTION AREA (WB) SELECT MENU

5) There are 9 white detect areas selected by the UP and DOWN buttons. Select the areas from nos. 1 to 9 that include the subject of main interest. (Factory setting is NO.1)

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 area, push the SET button to return to the "WHITE BALANE MENU".

·AWC (preset white balance)

After white balance condition is set, it is automatically stored in memory. The AWC mode should be used where the color temperature does not change once it has been set. The color temperature adjustment range of AWC is 2300 K～10,000 K.

```
◆  W H I T E   B A L A N C E   M E N U  ◆

▷MODE                : AWC          ······ Select White Balance mode

 PRESET  START  : PUSH  SET          ······ Set preset start

 R－GAIN  OFFSET:  000               ······ Adjustment of the R gain offset
 B－GAIN  OFFSET:  000               ······ Adjustment of the B gain offset

 RET                                 ······ Return to the main menu
 END                                 ······ End of menu display
```

WHITE BALANCE MENU (MODE: AWC)

1) Use the UP and DOWN buttons to shift the cursor to "PRESET START".

2) Select a white object to image near the center of the screen.

3) When a SET button switch is pushed, the white balance adjustment is begun. At that time, "PUSH SET" enters the state of blinking.

4) The cursor moves to "R-GAIN OFFSET" when the automatic setting is completed. The time required in the automatic setting changes depending on the light condition. If the white balance is not correct after about 15 seconds, please repeat the process from step 1.

Fine-tuning of white balance

After Preset is completed, the white balance can be fine-tuned by the R/B gain offset.

1) Use the UP and DOWN buttons to shift the cursor to "R-GAIN OFFSET" or "B-GAIN OFFSET", then press the SET button. The adjustment value at the right of value flashes.

2) Change the "R-GAIN OFFSET" or "B-GAIN OFFSET" by pressing the UP and DOWN buttons. (Variable range: -128～000～+127)

3) Return the factory setting(000) by simultaneously pressing the UP and DOWN buttons for two seconds.

4) The setting is fixed when the SET button is pushed, and the cursor moves below by one line.

·MANUAL (preset white balance)

```
◆  W H I T E   B A L A N C E   M E N U  ◆

▷MODE                : MANUAL       ······ Select White Balance mode



 R－GAIN          :  000            ······ Adjustment of the R gain
 B－GAIN          :  000            ······ Adjustment of the B gain

 RET                                ······ Return to the main menu
 END                                ······ End of menu display
```

WHITE BALANCE MENU (MODE: MANUAL)

1) Use the UP and DOWN buttons to shift the cursor to "R-GAIN" or "B-GAIN", then press the SET button. The adjustment value at the right of value flashes.

2) Change the "R-GAIN" or "B-GAIN" by pressing the UP and DOWN buttons. (Variable range: -128～000～+127)

3) Return the factory setting(000) by simultaneously pressing the UP and DOWN buttons for two seconds.

4) The setting is fixed when the SET button is pushed, and the cursor moves below by one line.

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) Use the UP and DOWN buttons to shift the cursor to "SUB MENU", then press the SET button to display the "SUB MENU".

```
      ◆ SUB MENU ◆
▷ITEM          :PICTURE      ······ Select SUB MENU item

 CHROMA        : 000         ······ Chroma setting[*]
 DETAIL        : 000         ······ Detail setting
 PEDESTAL      : 000         ······ Pedestal level setting
 GAMMA         :ON           ······ Gamma setting
 DNR           :AUTO(HIGH)   ······ Digital noise reduction setting
 POLARITY      :POSITIVE     ······ Negative/positive
 RET                         ······ Return to the main menu
 END                         ······ End of menu display
```

(*) Note: KP-E500 is not displayed.

SUB MENU (ITEM: PICTURE)

·CHROMA [Only KP-DE500 Type]

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

1) Use the UP and DOWN buttons to shift the cursor to "CHROMA", then press the SET button. The adjustment value at the right of value flashes.

2) Change the "CHROMA" by pressing the UP and DOWN buttons. (Variable range: -128〜000〜+50)

3) Return the factory setting(000) by simultaneously pressing the UP and DOWN buttons for two seconds.

4) The setting is fixed when the SET button is pushed, and the cursor moves below by one line.

NOTE

1) The color noise might stand out when the color level is raised.

2) CHROMA is fixed to "-128" and cannot be adjusted by the B/W MODE setting at a monochrome image.

·DETAIL

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

1) Use the UP and DOWN buttons to shift the cursor to "DETAIL", then press the SET button. The adjustment value at the right of value flashes.

2) Change the "DETAIL" by pressing the UP and DOWN buttons. (Variable range: -128〜000〜+127)

3) Return the factory setting(000) by simultaneously pressing the UP and DOWN buttons for two seconds.

4) The setting is fixed when the SET button is pushed, and the cursor moves below by one line.

NOTE

The noise might stand out when the detail level is raised.

·PEDESTAL

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

1) Use the UP and DOWN buttons to shift the cursor to "PEDESTAL", then press the SET button. The adjustment value at the right of value flashes.

2) Change the "PEDESTAL" by pressing the UP and DOWN buttons. (Variable range: -128〜000〜+127)

3) Return the factory setting(000) by simultaneously pressing the UP and DOWN buttons for two seconds.

4) The setting is fixed when the SET button is pushed, and the cursor moves below by one line.

·GAMMA

1) Use the UP and DOWN buttons to shift the cursor to "GAMMA".

2) Press the SET button to shift the mode in the sequence "ON", "OFF". Factory setting is "ON".

OFF : γ =1.0
ON : γ =0.45

·DNR (Digital noise reduction)

It is a function to decrease the noise generation by AGC.

1) Use the UP and DOWN buttons to shift the cursor to "DNR".

2) Press the SET button to select the setting sequentially in the following order. Factory setting is "AUTO(HIGH)".

SET button: **AUTO(HIGH)→ON-1→ON-2→ON-3→ON-4 →ON-5→ON-6→ON-7→OFF →AUTO(LOW)→AUTO(MID)**

AUTO( ) : It synchronizes with the amplification of AGC and the DNR setting changes from turning "OFF" to "ON-7".

LOW : Movement priority mode (Change into "ON-5" in the maximum.)

MID : The middle mode (Change into "ON-6" in the maximum.)

HIGH : Image quality priority mode (Change into "ON-7" in the maximum.)

OFF : DNR doesn't operate.

ON-*(1〜7) : DNR always operates. The afterimage increases according to the coefficient of the mode, and the noise decrease is effective.
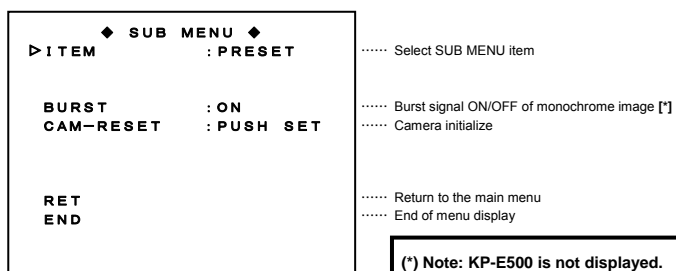
・POLARITY

1) Use the UP and DOWN buttons to shift the cursor to "POLARITY".

2) Press the SET button to shift the mode in the sequence "POSITIVE", "NEGATIVE". Factory setting is "POSITIVE".

The negative polarity is convenient when using negative material, such as negative film.

・Change in submenu item

1) Use the UP and DOWN buttons to shift the cursor to "ITEM".

2) Press the SET button to shift the mode in the sequence "PICTURE", "PRESET".

The display changes into the following menu when "ITEM" is "PRESET".

```
        ◆ SUB  MENU ◆
▷ITEM            :PRESET          ······ Select SUB MENU item


  BURST          :ON             ······ Burst signal ON/OFF of monochrome image [*]
  CAM−RESET      :PUSH SET       ······ Camera initialize


  RET                             ······ Return to the main menu
  END                             ······ End of menu display
                                 ┌─────────────────────────────────┐
                                 │ (*) Note: KP-E500 is not displayed. │
                                 └─────────────────────────────────┘
```

SUB MENU (ITEM: PRESET)

・BURST [Only KP-DE500 type]

Burst signal ON/OFF when a monochrome image is output is set.

1) Use the UP and DOWN buttons to shift the cursor to "BURST".

2) Press the SET button to shift the mode in the sequence "ON", "OFF". Factory setting is "ON".

　　ON : The burst signal is added
　　OFF : The burst signal is not added

NOTE

A malfunction may occur when the camera is connected to a VTR and monitor when the BURST is set to OFF.
Please change after confirming the specification of the connected equipment enough.


・CAM-RESET

It returns the camera settings to the factory presets that were set in the factory.

1) Use the UP and DOWN buttons to shift the cursor to "CAM-RESET".

2) Press the SET button for two seconds or more, it executes it. Afterwards, it returns to the "MAIN MENU".

Remote menu operation

An optional remote plug is available to enable operating the camera mode and set buttons by remote control. Confirm the plug is properly wired as indicated in the figure and connect it to the rear panel Remote connector. Do not connect anything to the unused Pins.
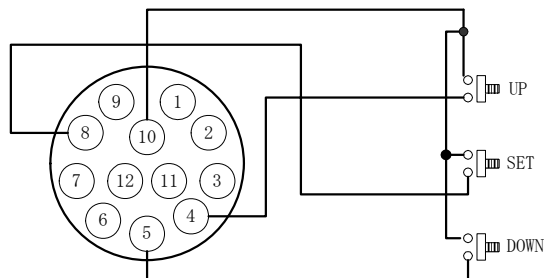
Remote plug(option)

External key switch connections for remote operation

Keep the distance between the remote plug and external key switches to less than about 2 meters. Disconnect the remote plug from the camera Remote connector when not using the key switches.

NOTE
Be sure to switch off the camera power before connecting or disconnecting the remote plug.

Pin	Signal	Abbrev.	Remarks
1	Not connected	N.C.	Do not connect
2	Serial data input	Tx	Connect to RS-232C data terminal
3	Serial data output	Rx	Connect to RS-232C data terminal
4	Up key	UP	Key switch connection
5	Down key	DOWN	Key switch connection
6	Not connected	N.C.	Do not connect
7	Not connected	N.C.	Do not connect
8	Set key	SET	Key switch connection
9	Not connected	N.C.	Do not connect
10	GND	GND	Connect to RS-232C ground
11	Not connected	N.C.	Do not connect
12	Not connected	N.C.	Do not connect

Remote operation with RS-232C
Signals 2, 3 and 10 can be used for control by personal computer. Consult dealer for retailed information.

Specifications

1.Color system	NTSC	
2.Pickup element	1/2-inch progressive scan frame interline CCD(with on-chip microlenses)	
Total pixels	680(H)× 500(V)	
Effective pixels	658(H)× 489(V)	
Scanning area	6.58(H)× 4.89(V)mm	
Sell size	10.0(H)× 10.0(V)µm	
3.Scanning system	2:1 interlace	
4.Scanning frequency	Hor. 15.734kHz	
	Ver. 59.94Hz	
5.Sync system	internal	
6. Video signal output	KP-DE500：VBS1.0Vp-p/75Ω	
	KP-E500：VS1.0Vp-p/75Ω	
7. Signal processing	Digital processing (input 10 bits)	
8. S/N(Y signal)	More than 50dB (AGC,enhancer and gamma OFF)	
9. Resolution(Y signal at center)	Hor. : 480 lines	
	Ver. : 350 lines	

10.Minimum illumination
  KP-DE500
   0.009 lx (Color, F1.4, AGC ON, SENS UP OFF, 50IRE)
   0.0005 lx(Monochrome, F1.4, AGC ON, SENS UP OFF, 50IRE)
   0.00015lx(Color 64 time accumulation, F1.4, AGC ON, 50IRE)
   0.000008lx
        (Monochrome 64 time accumulation, F1.4, AGC ON, 50IRE)

  KP-E500
   0.0003 lx
      (Monochrome, F1.4, AGC ON, SENS UP OFF, 50IRE)
   0.000005 lx
      (Monochrome 64 time accumulation, F1.4, AGC ON, 50IRE)

11. Sensitivity setting   AGC OFF/ON(Factory setting is1/60)
                 Manual Gain Adjustable at AGC OFF
                 Limit Gain Adjustable at AGC ON

12. Electronic shutter speeds
           Selectable in 7 steps & AES
           (Factory setting is 1/60)
           1/60,1/100,1/125,1/250,1/500,1/1000,1/2000
           AES:From 1/60 second to 1/2000 second

13. Integration multiple [SENS UP] setting
        : Automatic or Manual (fixed) (Factory setting is OFF)
           Automatic : 2,4,6,8,10,12,16,32,64 times
           Manual : 2,4,6,8,10,12,16,32,64,88,128 times

14. Backlight compensation   ON/OFFswitchable
                 Sensing area:selectable from 9 areas

15.Auto-iris lens outputs

Video signal Input type lens	Luminance signal 1.0Vp-p/high impedance Power supply 12V DC 40mA
Iris control voltage input (galvanometer)	Coupling coil impedance Damper:1150Ω±10% Drive:190Ω±10%

16. White balance
Only KP-DE500
    (color)

Selectable in 3 modes
(Factory setting is ATW)
Auto-tracking[ATW] / preset[AWC] /
R/B gain manual control[MANUAL]

17. Text display   22 characters (number, alphabet, and mark)

18. B/W mode   Selectable in 3 modes (Factory setting is OFF)
Only KP-DE500   OFF (Color always mode)
    (color)   ON   (B/W always mode)
AUTO(Mode selected in response to
brightness)
Can be set for high, medium or low

19.NDR   Selectable in 3 modes
 (Noise reduction) (Factory setting is AUTO(HI))
OFF / AUTO / ON

20. Lens mount   C/CS mount

21. Ambient temperature   -10～＋50℃、30～80%RH

22. Storage ambient   -20～＋60℃、20～90%RH

23. Power supply   12 VDC ± 10 %

24. Power consumption   Approx. 1.5A
(Omitting 40mA for auto-iris lens)

25. External dimensions   64(W)× 63(H)× 123(D)mm

26. .Mass   Approx. 610g

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

Accessories

Supplied accessories

Operation manual   1
DC input plug   (R03-P3F)   1

Optional accessories

Lenses (see Page 7)
Remote plug   HR-10A-10P-12P(01) (Part code: JMH0093)