

**Ikegami**

# **INSTRUCTION MANUAL**

**MODEL ICD-503**

**COLOR CCD CAMERA**

Thank you very much for your purchase of the Ikegami Color Video Camera.  
Please read this Instruction Manual carefully in order to gain a full understanding of its functions and performance.

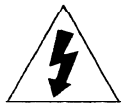
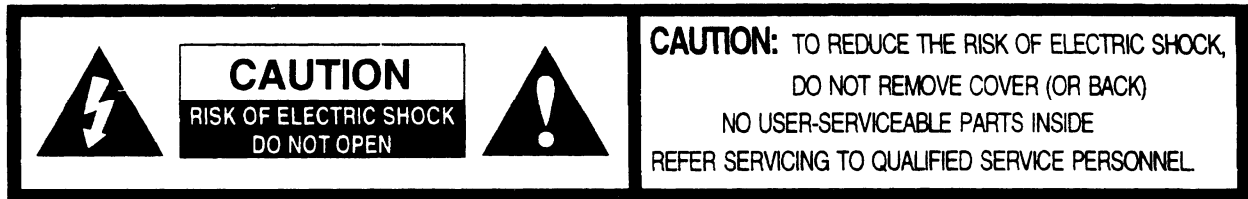
Ikegami will not assume any responsibility for unrecorded images which might happen due to failures in the video camera, VCR or video tapes.

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### OUTDOOR USE WARNING

WARNING – TO PREVENT FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.



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



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

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

**CAUTION:**

**ANY CHANGES OR MODIFICATIONS NOT EXPRESSLY APPROVED BY THE PART RESPONSIBLE FOR COMPLIANCE COULD VOID THE USERS AUTHORITY TO OPERATE THE EQUIPMENT.**

# ***IMPORTANT SAFEGUARDS***

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- **Read Instructions** – All the safety and operating instructions should be read before the appliance is operated.
- **Retain Instructions** – The safety and operating instructions should be retained for future reference.
- **Heed Warnings** – All warnings on the appliance and in the operating instructions should be adhered to.
- **Follow Instructions** – All operating and use instructions should be followed.
- **Cleaning** – Unplug this video product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
- **Attachments** – Do not use attachments not recommended by the video product manufactures as they may cause hazards.
- **Water and Moisture** – Do not use this video product near water – for example, near a bath tub, wash bowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool, and the like.
- **Accessories** – Do not place this video product on an unstable cart, stand, tripod, bracket, or table. The video product may fall, causing serious injury to person, and serious damage to the appliance. Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer, or sold with the video product. Any mounting of the appliance should follow the manufacturer's instructions, and should use a mounting accessory recommended by the manufacturer.
- **Power Sources** – This video product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your home, consult your appliance dealer or local power company. For video products intended to operate from battery power, or other sources, refer to the operating instructions.
- **Grounding or Polarization** – This video product is equipped with a polarized alternating current line-plug (a plug having one blade wider than the other) or a 3-wire grounding-type plug (a plug having a third grounding pin). This is a safety feature. The plug having one blade wider than the other will fit into the power outlet only one way. If you are unable to insert the plug fully into the outlet, try reversing the plug. The plug having a third grounding pin will only fit into a grounding-type power outlet. If the plug should fail to fit, contact you electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug or the grounding-type plug.
- **Power-Cord Protection** – Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.
- **Lightning** – For added protection for this video product receiver during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the cable system.  
This will prevent damage to the video product due to lightning and power-line surges.

- **Power Lines** – An outside antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can fall into such power lines circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits as contact with them might be fatal.
- **Overloading** – Do not overload wall outlets and extension cords as this can result in a risk of fire or electric shock.
- **Object and Liquid Entry** – Never push objects of any kind into this video product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the video product.
- **Servicing** – Do not attempt to service this video product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.
- **Damage Requiring Service** – Unplug this video product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
  - a. When the power-supply cord or plug is damaged.
  - b. If liquid has been spilled, or objects have fallen into the video product.
  - c. If the video product has been exposed to rain or water.
  - d. If the video product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the video product to its normal operation.
  - e. If the video product has been dropped or the cabinet has been damaged.
  - f. When the video product exhibits a distinct change in performance – this indicates a need for service.
- **Replacement Parts** – When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock or other hazards.
- **Safety Check** – Upon completion of any service or repairs to this video product, ask the service technician to perform safety checks to determine that the video product is in proper operating condition.

# 1. Handling precautions

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- Do not install the unit where it is exposed to rain or in a highly humid place. The ambient temperature is recommended to be from -10°C to +50°C.
- Never disassemble the camera.  
Never open and touch the inside of the camera. A trouble or accident may result.
- Keep the camera free from any foreign matter.  
Do not allow any metallic and flammable pieces near the camera. An accident or failure may result.
- Gently handle the camera.  
Be very careful not to drop or shock the camera. A trouble or accident may result.
- Never direct the camera toward the sun.  
Be careful not to expose the lens to the sun whether the camera is in use or not.
- Avoid any intense light.  
If there is a very bright object (giving intense light) on part of the screen, the object may cause streaking in the vertical or horizontal direction. This is called the smear phenomenon peculiar to solid-state imaging devices, and does not mean camera trouble.

## ■ In case of trouble or malfunction

If you encounter anything unusual (unusual noise, smell, smoke) with the camera or a trouble (sudden picture cut-off from the screen), immediately switch off the power. Contact your dealer or sales representative.

## Camera care

Turn off the power. Wipe the camera's exterior clean with a clean soft, dry cloth. If stain or spot is tough to remove, gently wipe it off with a cloth which has been dampened with water-diluted furniture cleaning agent and then well squeezed.

To clean up the lens and other delicate parts, use a camera lens blower or lens cleaning paper (available in camera shops).

## **2. General**

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The ICD-503 is a one-chip CCTV color camera that employs a 1/3-inch CCD (Charge Coupled Device). The high-sensitivity camera features AES (Automatic Electronic Shutter), back-light compensation, 2-way auto iris, and other functions. These basic functions are suitable for monitoring applications.

## **3. Features**

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### **1) High sensitivity and resolution**

The complementary color CCD of 250,000 picture elements with on-chip micro-lens is adopted in order to give high sensitivity and resolution. The horizontal resolution is 330 lines and the minimum illumination is 1.5 lux/F1.4.

### **2) TTL (Through The Lens) auto white balance**

The unit has the TTL fully automatic white balance circuit which automatically corrects the white balance with the light coming through the lens. The balance can be automatically controlled to an appropriate level independently of the subject's color temperature fluctuations.

### **3) AES (Automatic Electronic Shutter)**

The unit is also provided with the AES function to give a sensitivity ratio of 1 : 1300. The variable stepwise control is used for smooth sensitivity control. An iris lens, even if fixed, provides stable video output that is equivalent to the F1.4-F50 auto iris.

※ This function does not work in 50-Hz regions. On-screen images appear flickering because of electric lighting.

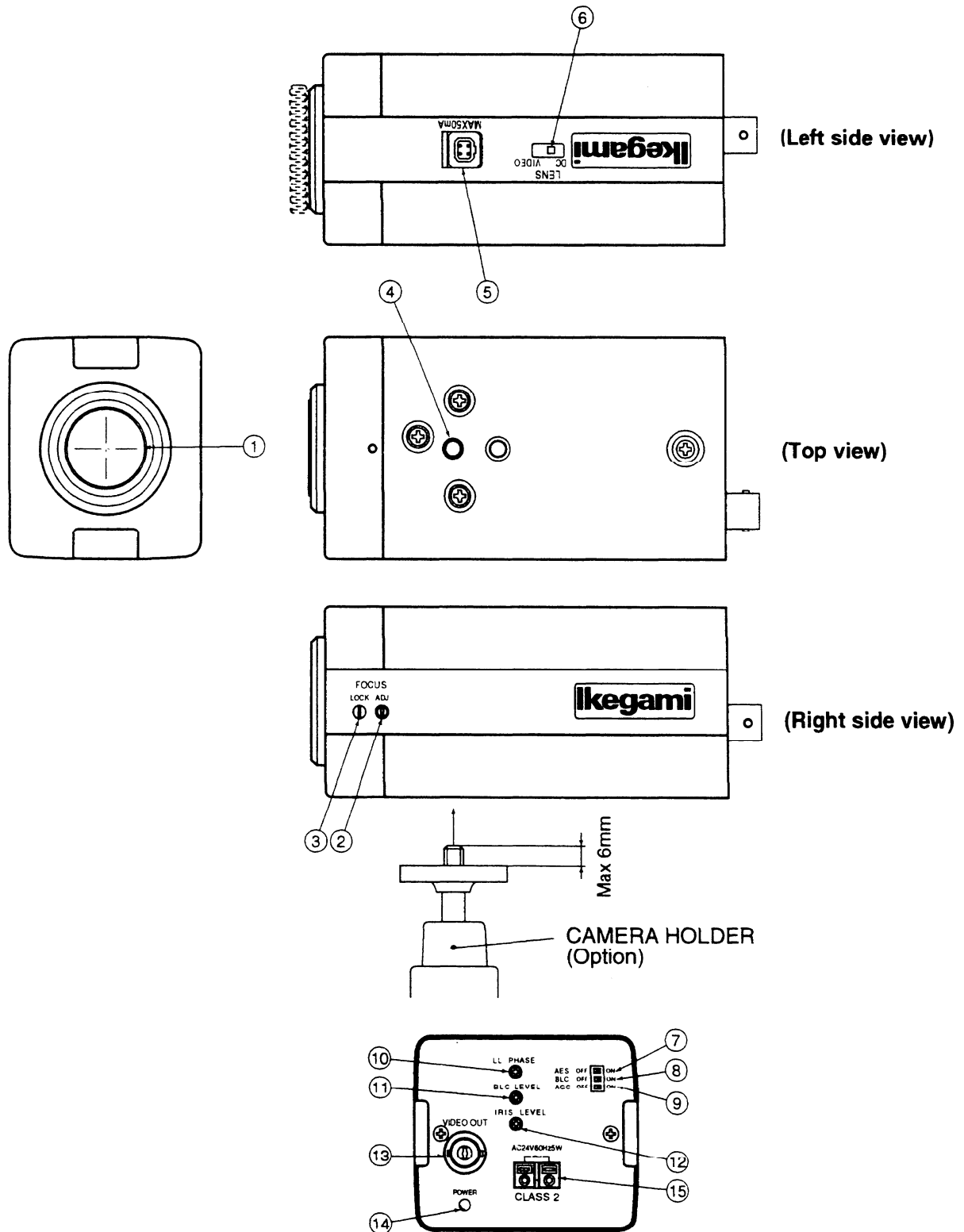
### **4) BLC (Back-Light Compensation)**

Images in the back-light can be effectively compensated with this function.

### **5) Flange focal distance adjustment**

With this adjustment mechanism, the focus tracking can be easily adjusted when the zoom lens is used.

# 4. Names of parts and their functions



① **Lens mount (CS mount)**

Used to install the lens. Accepts most types of CS mount lens. (Will accept C mount lens with optional CMA-40 C mount adapter)

② **Flange focal distance adjuster**

Used to adjust the flange focal distance depending on the lens used. Helpful if the lens' focus ring fails to put into focus.

③ **Flange focus lock screw**

Used to mechanically fix the camera's flange focal distance adjuster after its fine adjustment.

④ **Holder screw hole**

Used to mount the camera onto the camera holder. Also usable for general camera tripods.

**Note:** To attach the camera on a tripod or a camera holder, be sure to use mounting screws (1/4" -20UNC) that are shorter than 6 mm. (Do not over tighten)

⑤ **Auto iris lens connector**

Specifically used to connect the auto iris lens.

⑥ **Lens selector switch (LENS)**

Used to choose between the video iris and the DC iris depending on the auto iris lens in use.

⑦ **AES selector switch (AES)**

Used to turn on and off the AES function. (When using non-auto iris lens)

⑧ **Back-light compensation selector switch (BLC)**

Used to switch on and off the back-light compensation function.

⑨ **AGC selector switch (AGC)**

Used to turn on and off the AGC function.

⑩ **LL phase adjust control (LL PHASE)**

Used to adjust the phase between the video output and the power line with the above SYNC switch at LL.

⑪ **Back-light compensation adjust control (BLC LEVEL)**

Used to adjust the compensation level with the above BLC switch on.

⑫ **Iris level control (IRIS LEVEL)**

Use to adjust the iris level with the DC lens in use.

⑬ **Video output terminal (VIDEO OUT)**

Supplies video output signal. Connected to the video input terminal of a monitor, switcher, etc. (To be terminated with a 75-ohm impedance)

⑭ **Power LED indicator (POWER)**

Stays on in green while the camera power is on.

⑮ **AC24V power input terminal**

Used to receive AC24V power. AC24V±10% is acceptable.

**Note:** Applicable wires for terminal ⑮

Solid wires : AWG26-18 (0.4-1.0 mm dia.)

Flexible stranded wires : AWG22-20

# 5. Connection

## 5-1. Auto iris lens connector

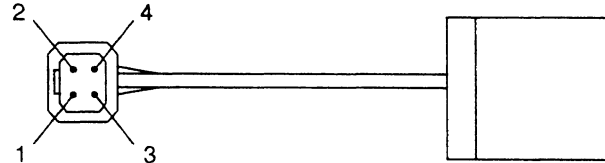
Use the accompanying auto iris lens control connector

• **For the video type auto iris lens**

Set the lens selector switch to VIDEO position.

— Connector cable leads —

1. Red (power)
2. Not used
3. White (video)
4. Black (shielded)



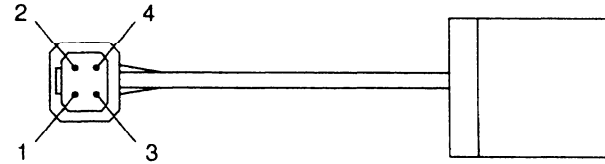
※ Dress the end of the green lead not to allow short-circuit.

• **For the DC type auto iris lens**

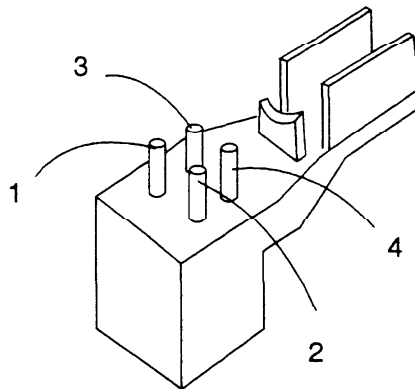
Set the lens selector switch to DC position.

— Connector cable leads —

1. Damping coil (-)
2. Damping coil (+)
3. Driving coil (+)
4. Driving coil (-)



※ Connect the leads as shown above. Refer to the instructions of the lens.

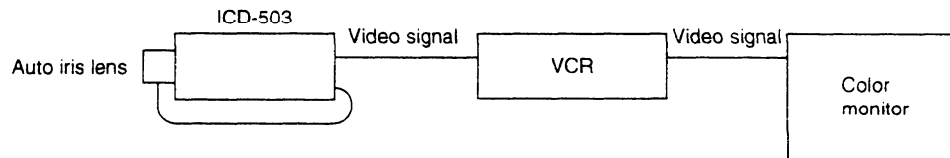


Numbers of connector pins

## 5-2. Video output terminal (VIDEO OUT)

- This is the output terminal of the video signal.
- The terminal is used to connect the video camera to the video input terminal of a monitor, switcher or the like. (To be terminated with a 75-ohm impedance)
- Use a coaxial cable for connection. (Copper shielded-type only)

(Typical connections)

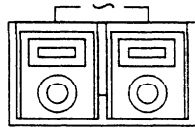


## 5-3. Power cord connections

- **AC24V type**

The camera can be driven on AC24V power.

AC24V60Hz5W



Supply AC24V ( $\pm 10\%$ )  
to the terminal block on the rear panel.

### **Caution:**

This installation should be made by a qualified service person and should conform to all local codes.

Make complete connections before supplying the power. To turn on and off the power, use the switch of the power unit.

## Connections on power input terminal block

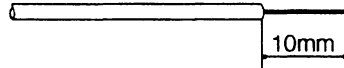
### (1) Applicable wire thicknesses

- ① Solid conductor : AWG26-18 (0.4-1.0 mm dia.)
- ② Flexible stranded conductor : AWG22-20

### (2) Wire end dressing

Peel off the wire sheath by about 10 mm.


For the flexible stranded wire, twist the conductor well enough.




### (3) Connections

**Note** : Be sure to turn off the power switch of the power supply before connecting and disconnecting the wires.

#### ① Connecting

- a. For solid wires with conductor 0.8-1.0 mm in diameter, just insert the wire end into the connection hole of the terminal block.
- b. For thinner solid wires or flexible stranded wires, hold down the button marked with  on the terminal block using a small bladed screwdriver and insert the wire end into the connection hole.
- c. Finally, gently pull the wire to make sure the connection is tight.

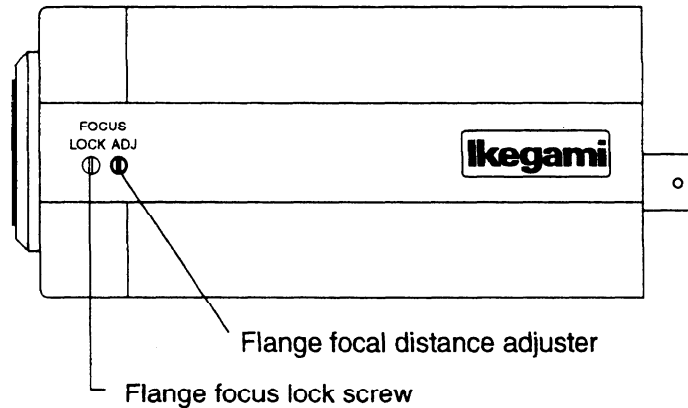
#### ② Disconnecting

Hold down the above  -marked button on the terminal block with the small bladed screwdriver and pull out the wire. If the wire is not easy to pull out, press the button a little harder. Never try to give the wire too strong a pull, because otherwise the wire may be broken.

# 6. Lens adjustment

## 6-1. Flange focal distance adjustment

The flange focal distance is the distance between the lens mounting surface and the focal point. In some cases, it is necessary to readjust this distance; that is to say, if the focus ring on the lens fails provide perfect focusing, use the flange focal distance adjuster shown below.



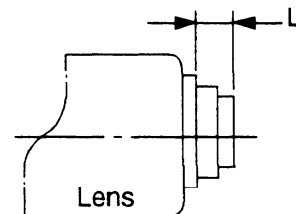
Before starting the following adjustments, loosen the flange focus lock screw. When finished retighten flange focus lock screw.

### Notes:

- Both C mount lenses and CS mount lenses can be used on this camera. Attach the C mount adaptor (optional), however, depending on the type of lens used. See the table below.

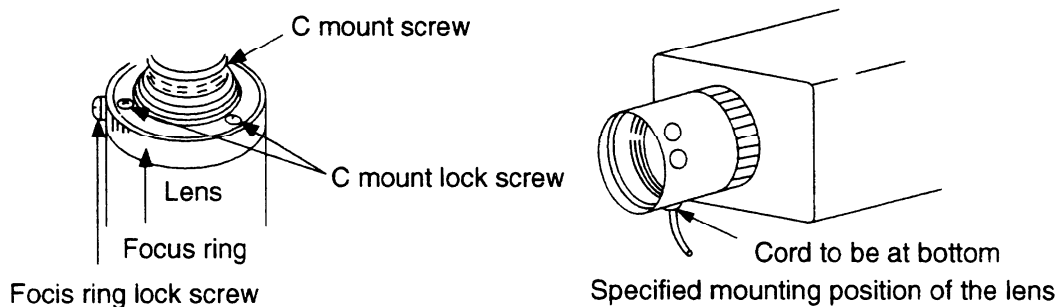
Lens mount	Necessary/Unnecessary
C	Necessary
CS	Unnecessary

- The dimension "L" at the lens mount (as shown at right) must be shorter than 10 mm for the C mount lens and shorter than 5 mm for the CS mount lens. If longer than specified, the lens may be mal-positioned or the camera itself may be damaged.



· **When using the fixed focus lens**

- ① Open the iris as much as possible. Set to a distant object and turn the focus ring to bring the object in focus.
- ② Set to an object nearby and turn the focus ring to bring the object in focus.
- ③ If either the distant or the nearby object is not brought into focus, adjust the focus with the flange focal distance adjuster.
- ④ Repeat the above steps several times until the focus can be achieved only with the focus ring for both the distant and nearby objects.
- ⑤ When the auto iris lens is used, position the cord of the lens as shown below. If the lens positioning is specified in the lens instructions, follow it.



**Note:**

When adjusting the focus for a distant object, keep the distance more than 2,000 times longer than the focal distance of the lens mounted. (When the lens' focal distance is 7.5 mm, for example, the object should be 15 m or more away.)

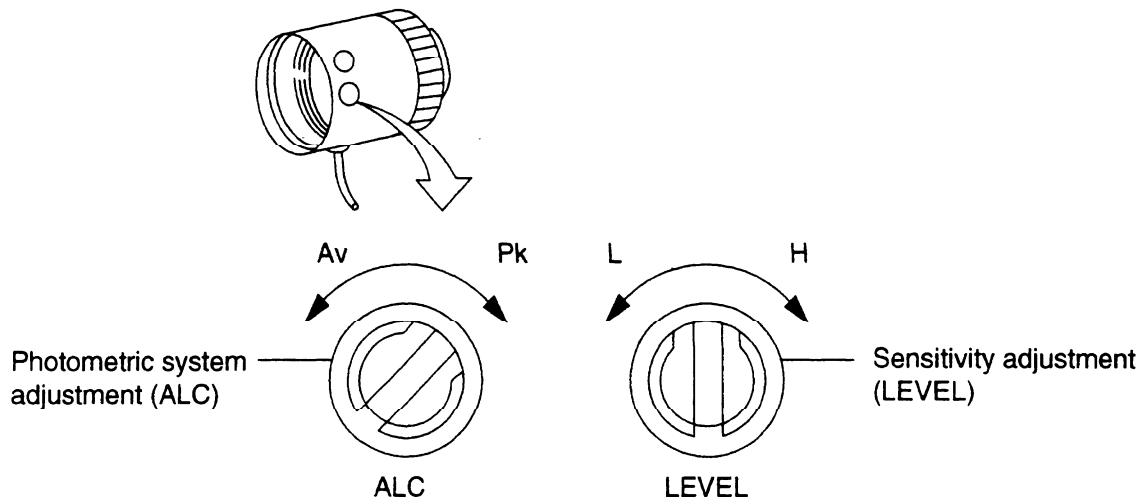
· **When using the zoom lens**

- ① Open the iris. Set the zoom lens all the way to the TELE position. Adjust the focus with the focus ring.
- ② Now set the zoom lens all the way to the WIDE position. If the image is out of focus, readjust the focus with the flange focal distance adjuster.
- ③ Repeat the above steps ① and ② several times in order to improve the focus in both the TELE and WIDE positions. Continue this until the best focus is obtained.

**Note:**

Keep the distance to the object more than 5 times longer than the minimum image forming distance of the lens mounted. (When the minimum image forming distance of the lens is 1 m, for example, the object should be 5 m or more away.)

## 6-2. Auto iris lens (video iris type) adjustment



- **Adjust the ALC and LEVEL controls of the auto iris lens in the following conditions.**

- ① Shutter speed set at 1/60 sec.
- ② AGC control on
- ③ BLC (back-light compensation) to be basically made with AGC control off

- **Sensitivity adjustment (LEVEL)**

Shoot an object, the contrast of which is relatively low, under sufficient illuminance (over 1000 lux). While watching the monitor screen, adjust the LEVEL control so that the image be appropriate in brightness and tone. For this adjustment, select an evenly lit place and keep the ALC control fully at the Av position.

Turning to H direction : If the entire screen is rather dark or there is much noise, turn the LEVEL control in the H direction to make the screen brighter.

Turning to L direction : If the entire screen is rather whitish and white spots are seen in colored areas, turn the LEVEL control in the L direction to make the screen darker.

· **Photometric system adjustment (ALC)**

While watching the monitor screen, choose a photometric method that suits the object. Adjust the ALC control to obtain an optimum image.

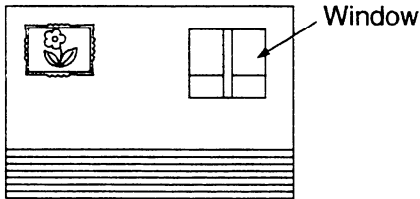
Turning in Av direction : Turn the ALC control in the Av direction for the average photometric method.

At the end of the Av direction, the iris is automatically adjusted with the average video signal level of the object as the right photometric value.

Turning in Pk direction : Turn the ALC control in the Pk direction for the peak photometric method.

At the end of the Pk direction, the iris is automatically adjusted with the high-luminance video signal level of the object as the right photometric value.

**Notes:**



· Let us imagine a scene shown at left. To show the picture hanging on the wall on the screen, turn the ALC control in the Av direction. In this case, the window and the outdoor will be saturated in white.

- Turn the ALC control in the Pk direction to show the window and the outdoor on the screen in the above situation. In this case, the picture and the area around it on the wall will be low in luminance and look dark on the screen.
- If the scene being shot is almost evenly lit, the level will not change much whichever direction the control is turned in.

**Notes:**

- Make the LEVEL adjustment first and then the ALC adjustment.
- The sensitivity adjustment (LEVEL) is referred to as the video signal level. Do not turn the LEVEL control after the adjustment. Otherwise, the lens' sensitivity may change, resulting in degraded picture quality or malfunction in the worst case.

### **6-3. Auto Iris lens (DC iris type) adjustment**

When the DC iris lens is used, adjust the IRIS LEVEL control on the camera.

- (1) Shoot a scene in which the brightness-to-darkness (white-to-black) ratio is 50-50.  
Adjust the camera's IRIS LEVEL control so that the video level of the bright zone be 0.7Vp-p. Be careful not to shoot too dark a scene because otherwise satisfactory adjustment cannot be expected.

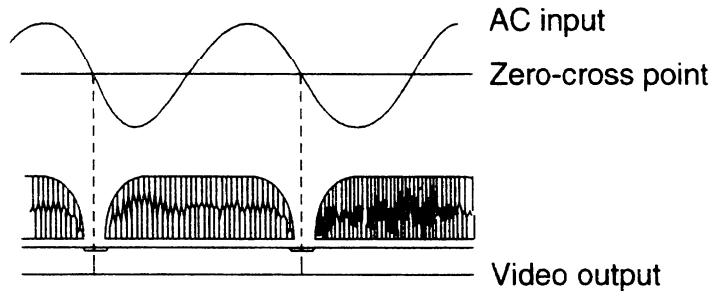
### **6-4. Manual lens adjustment**

- (1) With the AES selector at ON position  
Usually keep the lens iris open. However, if picture is over-driven it is therefore advisable to make two turns back from the open position.
- (2) With the AES selector at OFF position  
Adjust the lens iris according to the brightness of a subject.

# 7. User setting

## 7-1. LL (Line Lock)

The video output gets in sync with the power line.



- \* Using the LL PHASE control, the video output phase can be shifted by  $\pm 90^\circ$  with respect to the AC input line phase. See the above figure.
- \* This type of sync helps eliminate the so-called image peel-off phenomenon which would happen when two or more cameras are switched each other with a switcher, for example.

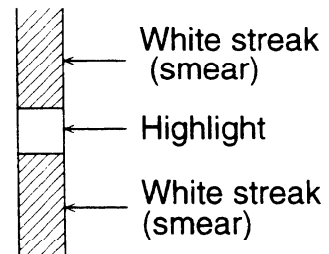
## 7-2. Automatic electronic shutter (AES) selector switch

The AES selector switch is used to turn on and off the automatic electronic shutter (AES) function of the camera.

- ON: In the AES mode  
The high-speed electronic shutter is used for automatic sensitivity control function. Proper video output is guaranteed even with a fixed-iris lens in use.
- OFF: In the normal mode

^ In the AES mode, such smear as shown at right may happen, which produces poor images on the screen.

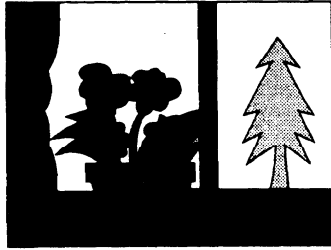
This is peculiar to CCD elements, but not a trouble. Switch off the AES function and use an auto iris lens to avoid such phenomenon.



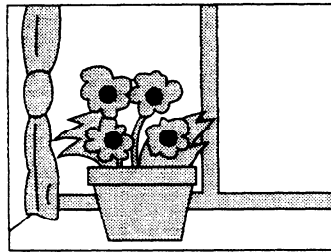
- \* Be sure to keep the AES function off when the auto iris lens is used.

### 7-3. **Back-light compensation selector switch (BLC)**

When fairly bright light (outside a window, for example) is behind a subject, the subject looks shadowy. In such a case, the backlight effect should be compensated.



BLC-OFF



BLC-ON

- Typical backlight compensation  
Let us look at the sketch at left. When shooting the house plant with the BLC switch off, the flowers will appear very dark because the background is very bright.  
To make the flowers look bright, turn on the BLC switch and adjust the BLC LEVEL control to get an optimum image. In the sketch at left, the level is adjusted for the flowers at the window, but the view outside the window looks whitish.
- \* The BLC function does not make a big difference when the entire scene is dark with no backlight.
- \* Hunting may occur under certain shooting condition. In such a case, adjust the BLC LEVEL control to get rid of the hunting

### 7-4. **Automatic gain control (AGC)**

- Usually keep the AGC switch at the ON position.
- Set the switch to the OFF position if noises (white spots) appear on a dark scene.

## ***8. Warranty and after-sale service***

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A warranty accompanies this product. Read and fill out the warranty card that you have received at your dealer. Keep this card in a safe place.

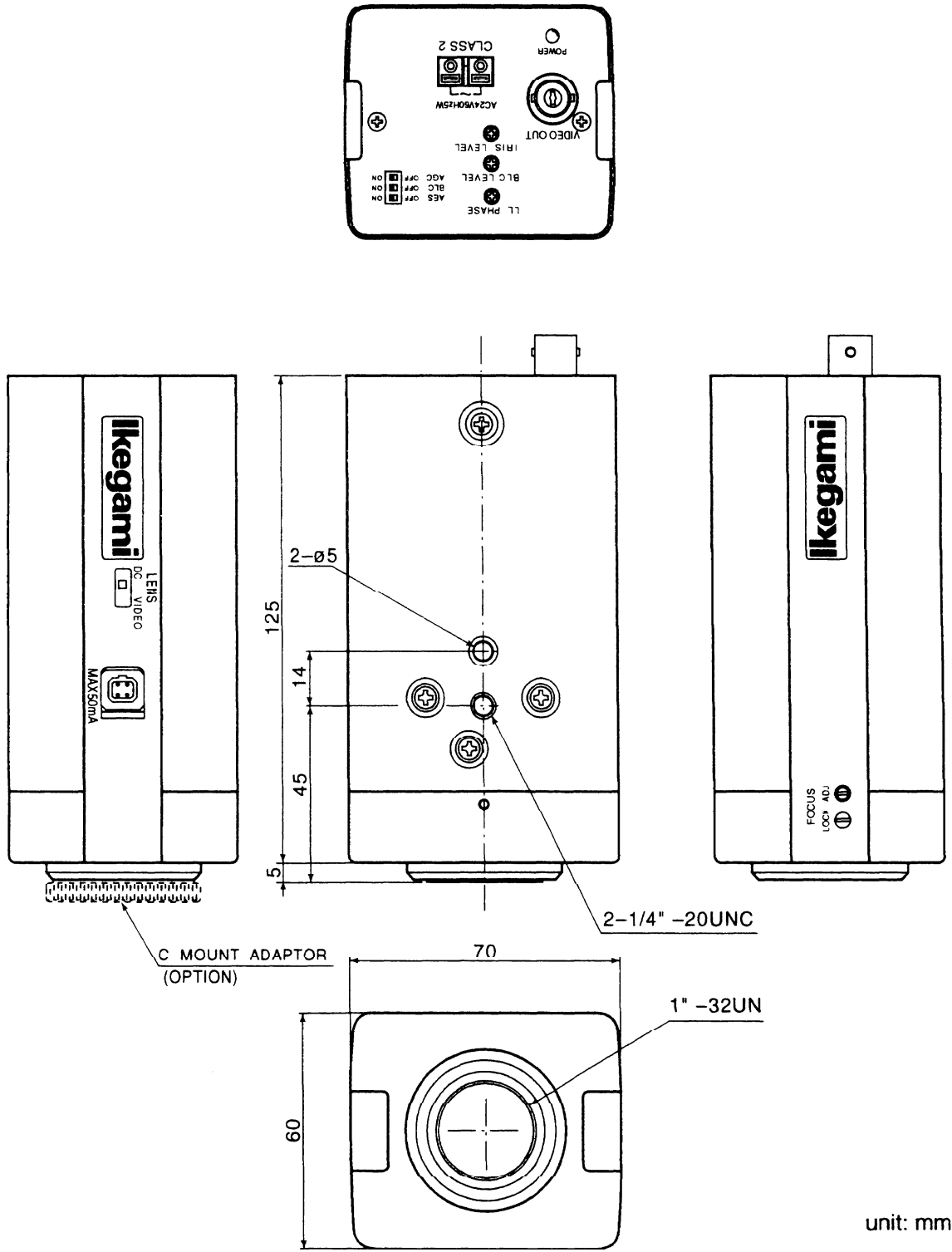
- Please consult Ikegami Electronics (U.S.A.) Inc. or your dealer for full warranty information. Your dealer will repair or replace free of charge within the warranty period according to the warranty coverage.
  - For repairs after the expiration of the warranty period, consult your dealer or sales representative. It will first be judged whether the trouble is repairable or not. Charged servicing will then be made upon request of the user.
  - Before you ask for servicing, take trouble of reading the Instruction Manual. If the unit still fails, take note of the model number, date of purchase, problem, etc. in detail, and inform your dealer or sales representative.
  - If you have questions about the after-sale service, contact your dealer or sales representative.
- ※ We suggest you ask for preventive inspection earlier.

## 9. Specifications

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- |   |  |
|---|--|
| 1) Imaging device:                              | 1/3" interline transfer type CCD   |
| 2) Color filter:                                | Complementary-color checkered color filter (Ye, Cy, Mg, G)               |
| 3) No. of effective picture elements:           | 512(H) x 492(V), approx. 250,000 picture elements                        |
| 4) Image size:                                  | 4.8(H) x 3.6(V) mm   |
| 5) Scanning system:                             | 525 lines at 60 Hz, 2:1 interlace, NTSC                                  |
| 6) Sync system:                                 | LINE-LOCK  |
| 7) Video output:                                | VBS 1.0 Vp-p/75 ohms   |
| 8) Horizontal resolution:                       | 330 lines  |
| 9) S/N ratio:                                   | 48 dB/rms or better (at rated illuminance)                               |
| 10) Standard illumination:                      | 2200 lux/F8 (color temperature 3200° K, reflectance 89.9%)               |
| 11) Minimum illumination:                       | 1.5 lux/F1.4 (color temperature 3200° K, reflectance 89.9%)              |
| 12) White balance:                              | TTL method, ATW  |
| 13) BLC function:                               | Provided (ON/OFF, with level control)                                    |
| 14) AES function:                               | Provided (ON/OFF), AES range 1: 1300                                     |
| 15) Auto iris function:                         | Video iris lens or DC iris lens selectable                               |
| 16) Lens mount:                                 | CS mount (C mountable)   |
| 17) Flange focal distance adjust :<br>mechanism | Provided (at right-hand side)  |
| 18) Power supply:                               | AC24V type ; AC24V $\pm$ 10%, 60 Hz                                      |
| 19) Power consumption:                          | AC24V type ; Approx. 5W  |
| 20) Ambient temperature:                        | -10°C to +50°C   |
| 21) External dimensions (W x H x D):            | AC24V type ; 70 x 60 x 125 mm  |
| 22) Weight:                                     | AC24V type ; Approx. 750g  |
| 23) Camera mount:                               | 1/4"-20UNC (top and bottom mounting)                                     |
| 24) Connector:                                  | VIDEO OUT ; BNC<br>LENS ; 4P (applicable plug;E4-191J-100)               |
| 25) Accessory:                                  | Instruction Manual, 1 copy   |
| 26) Option:                                     | Auto iris lens connector plug (E4-191J-100).<br>C mount adapter (CMA-40) |

# 10. External Appearance



unit: mm

# Ikegami

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