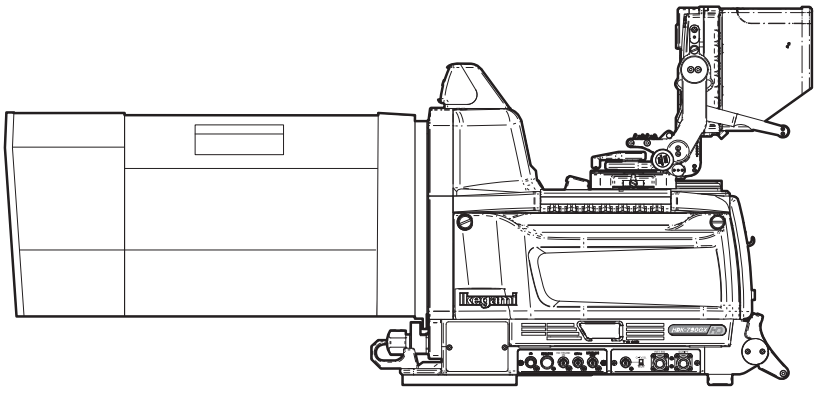


HDK-790GX

HIGH DEFINITION CAMERA SYSTEM

OPERATION MANUAL

Ikegami

HDK-790GX

HIGH DEFINITION CAMERA SYSTEM

OPERATION MANUAL

1403 Edition (U)

Ikegami

English

Instructions for Disposal of Electric and Electronic Equipment in Private Household

Disposal of used Electric and Electronic Equipment
(Applicable in the European Union and other European countries with separate collection systems)

This symbol on the product, or in the related documents in the package, indicates that this product shall not be treated as normal household waste. Instead, it should be taken to a proper applicable collection point or depot for the recycling of electric and electronic equipment.

By ensuring this product is disposed of correctly, you will help prevent possible negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. The recycling of materials will help to conserve natural resources.
For more detailed information about recycling of this product, please contact your local city authority, your household waste disposal service or the place where you purchased the product.

Deutsch

Vorschriften für die Entsorgung von elektrischen und elektronischen Geräten in Privathaushalten

Entsorgung von gebrauchten elektrischen und elektronischen Geräten
(In der Europäischen Union und anderen europäischen Ländern mit separaten Sammelsystemen anwendbar.)

Das auf dem Produkt angebrachte Symbol, bzw. die Symbole in den in der Packung beiliegenden Dokumenten, weisen darauf hin, dass dieses Produkt nicht als normaler Haushaltsmüll behandelt werden darf. Es muss deshalb an einer dafür vorgesehenen Sammelstelle abgeliefert werden, in der das Recycling von elektrischen und elektronischen Geräten durchgeführt wird.

Durch die ordnungsgemäße Entsorgung dieses Produkts tragen Sie dazu bei, dass unsere Umwelt und unsere Gesundheit nicht durch unsachgemäße Entsorgung negativ beeinflusst wird. Mit dem Recycling von Materialien tragen wir zur Bewahrung der natürlichen Ressourcen bei.
Für nähere Informationen hinsichtlich des Recyclings für dieses Produkt sprechen Sie bitte mit Ihrer zuständigen Behörde, Ihrer Hausmüll-Entsorgungsstelle oder dem Geschäft, wo Sie das Produkt gekauft haben.

Français

Consignes de mise au rebut des appareils électriques et électroniques dans les foyers privés

Mise au rebut des appareils électriques et électroniques
(Applicable dans l'Union Européenne et autres pays d'Europe ayant un système de récupération séparé)

Ce symbole apposé sur le produit ou dans les documents liés se trouvant dans l'emballage indique que ce produit ne doit pas être traité comme un déchet ménager normal. Il doit être porté à un point de récupération correct ou à un dépôt pour le recyclage des appareils électriques et électroniques.

En vous assurant que ce produit est correctement mis au rebut, vous aiderez à empêcher les conséquences possibles pouvant affecter l'environnement et la santé humaine, pouvant être causées par une mauvaise manipulation des déchets de ce produit. Le recyclage des matériaux favorise la conservation des ressources naturelles.
Pour des informations plus détaillées concernant le recyclage de ce produit, veuillez contacter les autorités locales, votre service de mise au rebut des déchets ménagers ou le lieu d'achat de votre produit.

Español

Instrucciones para eliminar equipos eléctricos y electrónicos de una casa privada

Eliminación de equipos eléctricos y electrónicos usados
(Normas aplicables en la Unión Europea y en otros países europeos con diferentes sistemas de recogida)

Este símbolo en el producto, o en los documentos relacionados, indica que este producto no deberá ser tratado como un residuo doméstico normal. En cambio, deberá ser llevado a un punto o lugar donde los equipos eléctricos y electrónicos sean recogidos para ser reciclados.

Asegurándose de que este producto sea eliminado correctamente, usted ayudará a impedir las posibles consecuencias negativas sobre el medio ambiente y la salud humana que podrían ser causadas por el manejo inapropiado de este producto como residuo doméstico. El reciclado de los materiales ayudará a conservar los recursos naturales.
Para conocer una información más detallada acerca del reciclado de este producto, póngase en contacto con las autoridades de su localidad, con su servicio de recogida de residuos domésticos o con el comercio donde adquirió el producto.

PRODUCTS CONFORMING TO RoHS DIRECTIVE

Following products described in this manual are products conforming to RoHS directive.

- HDK-790GX	Color Camera
- VF421HD, VF13XHD, VFL912HD, VFL200HD	Viewfinder
- CCU-970	Camera Control Unit
- OCP-200	Operation Control Panel
- MCP-200	Maintenance Control Panel
- CPH-200	Control Panel Hub
- BSH-200	Base Station Hub

Products conforming to RoHS directive include products that do not contain specified hazardous substances such as lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE) in electrical and electronic equipment excluding following exemption applications based on the EU directive (Directive2002/95/EC).

* About RoHS Directive

The RoHS directive stands for "the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment" and is one of environmental directives in Europe. This directive restricts the use of specified hazardous substances in electrical and electronic equipment.

● Applications exempted from RoHS directive compliance

Followings applications are permitted as exemptions from RoHS directive compliance.

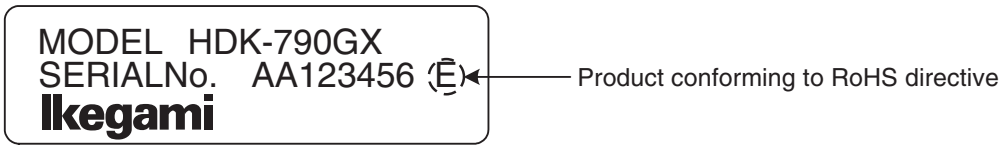
1. Mercury in compact fluorescent lamps not exceeding 5mg per lamp
2. Mercury in straight fluorescent lamps for general purposes not exceeding:
   - halophosphate 10mg
   - triphosphate with a normal lifetime 5mg
   - triphosphate with a long lifetime 8mg
3. Mercury in straight fluorescent lamps for special purposes
4. Mercury in other lamps not specifically mentioned in this Annex
5. Lead in the glass of cathode ray tubes, electronic components and fluorescent tubes
6. Lead as an alloying element in steel containing up to 0.35% lead by weight, aluminum containing up to 0.4% lead by weight and as a copper alloy containing up to 4% lead by weight
7. Lead in following items
   - Lead in high melting temperature type solders (i.e. tin-lead solder alloys containing more than 85% lead)
   - Lead in solders for servers, storage and storage array systems
   - Lead in solders for network infrastructure equipment for switching, signaling, transmission as well as network management for telecommunication
   - Lead in electronic ceramic parts (e.g. piezoelectronic devices)
8. Cadmium plating except for applications banned under Directive 91/338/EEC amending Directive 76/769/EEC relating to restrictions on the marketing and use of certain dangerous substances and preparations
9. Hexavalent chromium as an anti-corrosion of the carbon steel cooling system in absorption refrigerators
10. Lead used in compliant pin connector systems
11. Lead as a coating material for the thermal conduction module C-ring
12. Lead and cadmium in optical and filter glass
13. Lead in solders consisting of more than two elements for the connection between the pins and the package of microprocessors with a lead content of more than 80% and less than 85% by weight
14. Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit Flip Chip packages
15. Decabrominated diphenyl ether (Deca-BDE) in polymeric applications

MAINTENANCE OF PRODUCTS CONFORMING TO RoHS DIRECTIVE

Work with care about followings for maintenance of products conforming to RoHS directive.

1. Identification

- For products conforming to RoHS directive, the letter “E” is appended at the end of the serial number on the label. For models that the letter cannot be appended to the serial number, the letter “E” will be described in a distinguishable position on the label. A description example on a main label is shown below.



Label

- Print-circuit board of the products conforming to RoHS directive is manufactured by following methods.
  [1] Blue resist ink is used for the print-circuit board. (The color of conventional print-circuit board is green.)
  [2] Either one of the following marks is indicated by a serigraph or label.

Phase 3A

Phase 3

2. Soldering

Since the melting point of lead-free solder used for the products conforming to RoHS directive is 20 to 45 degrees Celsius higher than that of conventional solder with lead (Sn-Pb eutectic solder), a high temperature needs to be set to a soldering iron. Taking allowable temperature limit of the parts and stable work into consideration, use a soldering iron with excellent thermal recovery characteristics.

- Recommended solder composition is “Sn/3.0Ag/0.5Cu” or equivalent.
- Separate the soldering iron exclusively for RoHS products and the soldering iron for conventional use.
- Set the temperature of the soldering bit to 350 to 370 degrees Celsius.
  The temperature may need to be adjusted according to the size of the copper foil land on the print-circuit board and the tip width of the soldering bit.
- Finish by a lead-free solder looks dull or whitish compared to conventional solder with lead.
- If the customer mixed the lead-solder with the main body wiring or the circuit board, it becomes guarantee off the subject. Ikegami doesn't guarantee to do the repair work. Because the solder polluted with lead cannot be removed.

3. Parts

Be sure to use parts conforming to RoHS directive.

INFORMATION TO THE USER

1. 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.
   Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

2. Declaration of conformity
   The CE mark means that the following products will meet the Directive 2004/108/EC,2006/95/EC and the Standards EN55103-1 E4-E5, EN55103-2 E4-E5 (for EMC), EN60950-1 (for LVD).
   For European customer.

3. Rated current value of the camera when CCU-970 are used for the system operation is shown below.

		Rated current value :
· CCU-970	AC220V (50-60Hz)	2.0A

SAFETY PRECAUTIONS

This manual describes the precautions using various pictorial symbols for you to use the product safely. Please read these precautions thoroughly before use. The symbols and meanings are as follows:

The following hazard alert symbols are used to indicate the level of impact on the body or property when you do not follow the precautions.

⚠ ***WARNING***	Indicates that mishandling of the product by ignoring this label may lead to a danger resulting in a serious injury or death.
⚠ ***CAUTION***	Indicates that mishandling of the product by ignoring this label may lead to a danger resulting in an injury or property damage.

The following symbols are used to indicate the expected injury or hazards when you do not follow the precautions.

	Indicates general cautions on such matters as safe work, procedure, and installation location. Mishandling may not directly lead to death, injury, or property damage.
	Indicates that mishandling may cause an electric shock.
	Indicates that mishandling may cause a fire.
	Indicates that mishandling may cause injury.

The following symbol is used to indicate other precautions to prevent damage or hazard from occurring:

	Indicates prohibited action.

■ *Handling Precautions*

⚠ WARNING

Regarding the Product	
	Do not disassemble or modify the product which is not described in this manual. Doing so may cause fire, electric shock, or injury.

Regarding the Power	
	When you disconnect the cable, be sure to hold the plug and pull. Failure to do so may cause a fire or electric shock due to a damaged cable.
	To inspect or operate on the inside of the equipment, turn off the power and wait for one or two minutes before starting work. High voltage is present in some modules and connectors of this product. When you want to intercept a power supply surely, I pull a fiber cable of the camera side, or, please pull an AC plug of the CCU side.

⚠ CAUTION

Regarding the Product	
	Do not lift or hold the camera by the projection parts. If you lift or hold the camera by the viewfinder or the lens, you are prone to dropping it. Moreover, the connection parts between the camera and the viewfinder, or the camera and the lens may be exposed to unnecessary pressure, which may cause equipment damage. Always install the accessories or connect the cables after placing the camera on a fixed position. When installing such accessories as lens or microphone, fix the camera on a stable place (e.g. on a table, a tripod, etc.).
	Avoid use or storage in the following conditions: - Extremely high/low temperature - In direct sunlight for a long time, or near a heater - High humidity or dusty - Exposed to water or other liquid - Strong vibration or shock - Strong magnetic field or radio waves - lightning - In rain without the rain cover

Regarding the Product

Be sure to hold the plug and pull when you disconnect the cable.
Failure to do so may cause a fire or electric shock due to a broken cable.

Avoid moving the equipment suddenly from an extremely cold place to a warm place.
Condensation may occur in the Charged Couple Device (CCD) or other parts.

Do not drop or insert a metal object such as a pin or a foreign object into the equipment.

Do not spread or spill water or other liquid on the equipment.

Do not subject the equipment to a strong shock or vibration.
Doing so may cause damage or malfunction of the equipment.

Since a CCD is adopted as the image sensor in picture elements, no burning occurs in ordinary operation. However, when shooting a subject which emits an excessive amount of light (such as the sun) for long hours, take great care for temperature increase inside of the CCD.

Laser beams may damage the CCDs. If you shoot a scene that includes a laser beam, be careful not to let a laser beam become directed into the lens of the camera.

Before connecting a VTR or accessories, make sure that the camera and equipment to be connected are powered off. Also, be sure to use dedicated cables.

Excessive sound pressure from the headset may cause a hearing loss.

Regarding the Power and the Lithium Battery

Use the product in compliance with the rating of the fuse within the product and that within the Camera Control Unit (CCU). Otherwise, a fault can occur.

Do not use an unspecified battery.
Wrong usage of batteries may cause liquid leak, explosion, and heat, and at worst injury or fire.
When changing or discarding a battery, please contact Ikegami's sales and service centers.
Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.

Regarding the Fiber Connector and the Fiber Optic Cable

Fiber optic cable connectors are quite similar to each other in shape. Before connecting fiber optic cables, thoroughly check male or female, the diameter, type and manufacturer of connectors.

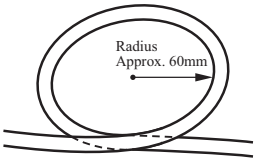
If the ferrule is dirty, wipe the dirt off with cotton swabs soaked in alcohol.

The fiber cable supplies AC 220 V power from CCU to the camera.
Although safety measures are fully taken such as the safety circuit that stops the power supply from the CCU within a short time after an optical fiber cable is removed or short-circuited, never force to bend, twist, or damage the cable, and take great care when handling.

Regarding the Fiber Connector and the Fiber Optic Cable

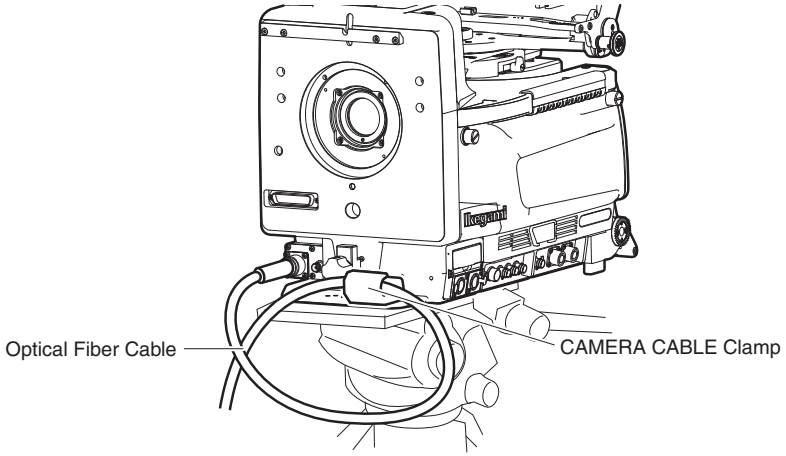
Take care for the following:

- When disconnecting the fiber optic cable from the camera or from the CCU, always hold the fiber connector (plug) and not the cable.
- Do not crush the cable.
- Since there can be various obstacles (such as a corner of a building, glass, rough ground surface) in places where the cable is connected, do not drag the cable without winding.
- Turn off the power before removing the fiber optic cable.
- The allowable radius of curvature of fiber optic cables is approximately six times of the outer diameter of cables (approx. 60mm for a φ9.2mm-wide cable). Do not force to wind less than specified. Forcible winding can break fiber leads within the cable.



Fiber Optic Cable

- When connecting a fiber optic cable to a fiber connector, anchor the fiber optic cable with a cable clamp.



■ *Environmental Cautions*

Regarding the product	
⚠	When continuously operating the product in a rainy, cold or hot conditions, use a rain cover, cold-weather cover, and shade cover respectively.
	Avoid storing the product in a dusty place for a long time. If unavoidable, use a dustproof cover.
	When shooting in places such as airports, military bases or transmitting stations where magnetic and radio fields are excessively strong, completely shield the camera by covering it with aluminum foil.

■ *Maintenance*

Regarding the product	
⚠	Before performing maintenance on the product, be sure to turn off the power for safety and for protection against malfunction.
	Clean the product using a dry and soft cloth.
	If the stain is hard, soak the cloth with water or detergent, wring well and wipe. If you use detergent, wipe off the detergent with a cloth that is soaked in just water and wrung well.

■ *Notice for Use*

- When carrying or storing the product, always use a carrying case.
- Before shooting important subjects, take test shots to obtain the desired effect.
- After using the product, always turn off the power.

■ *Regular Maintenance Recommended*

This product includes parts that wear out and have a limited life even in proper use or storage. Therefore, regular maintenance is recommended to extend the life and safe use of this product for a long time. Please contact Ikegami's sales and service centers for the regular maintenance and repair of our products.

HOW TO READ THE OPERATION MANUAL

This page explains general notes on reading the HDK-790GX Operation Manual, and the symbols and notations used in the manual.

■ *Notes on the Manual*

- This manual is written for readers with a basic knowledge of handling broadcast cameras.
- The contents of this manual are subject to change without notice in the future.

■ *Symbols*

The symbols used in this manual are as follows:

CAUTION:	Things you have to be careful during operation. Be sure to read.
Note:	Supplementary information or guidance
Reference:	Sections where related information is available
Term:	Explains the meaning of a term you need to know.

■ *Notations*

The following notations are used in this manual.

This product, camera	Indicates HDK-790GX.
CCU	Indicate CCU-970 Camera Control Unit.
OCP	Basically indicates OCP-200 Operation Control Panel.
MCP	Basically indicates MCP-200 Maintenance Control Panel.
“ ” - “ ” - “ ”	Indicates the items enclosed by double quotes (“ ”) are to be selected and confirmed in the order shown.

■ *Illustrations and Displays*

The illustrations and displays in the text are provided for explanation and may be slightly different from the actual equipment or image.

■ *Related Manuals*

- CCU-970 Camera Control Unit Operation Manual
- OCP-200 Operation Control Panel Operation Manual
- MCP-200 Maintenance Control Panel Operation Manual
- CPH-200 Control Panel HUB / BSH-200 Base Station Hub Setup Manual

■ *Structure of Operation Manual*

This manual is intended to help you operate the HDK-790GX safely and smoothly. This manual consists of seven chapters. We recommend you read them in sequence from Chapter 1 to Chapter 7 so that you can carry out all the work smoothly through the installation to the operation of the camera equipment.
This product supports various operation forms in the studio or field as a system camera with the combination of CCU-970 (camera control unit). Therefore, please also refer to the manuals such as for CCU-970 in addition to this manual.

Chapter 1

OUTLINE

Explains the features and the main operating systems of this product.
If you are not familiar with HDK-790GX High Definition Camera System, please start with this chapter.

Chapter 2

NAME and FUNCTION

Explains the name and function of each part of the Camera.

Chapter 3

INSTALLATION and CONNECTION

This chapter explains the installation method of this product and lenses, etc.
It also provides an operational example at a studio to explain the connection method between this product and peripherals.

Chapter 4

OPERATION

Explains setup before shooting.
Before shooting for the first time, read this chapter and check that this product is operating normally.

Chapter 5

CAMERA SETTINGS and ADJUSTMENT

This product realizes detailed settings to support a wide range of operations and various video expressions through the menu window. This chapter explains switch settings, menu settings, and DIP switch settings on the modules inside of the Camera.

Chapter 6

TROUBLE SHOOTING and MAINTENANCE

When the alarm lamp lights during the operation of this product, read here to know the problem. This chapter also explains the regular maintenance such as cleaning of connectors and resetting of breaker.

Chapter 7

SPECIFICATIONS

Explains the specifications of this product.

CHANGING INFORMATION

Contains revision information of design revision or customer-specific specification requested by customers. Read by comparing with the main text of the operation manual. (“CHANGING INFORMATION” may be sent to you later on.)

HDK-790GX

High Definition Camera System

Operation Manual

Chapter 5. CAMERA SETTINGS and ADJUSTMENT

Chapter 6. TROUBLE SHOOTING and MAINTENANCE

Chapter 7. SPECIFICATIONS

1

OUTLINE

■ HDK-790GX

This product realizes high quality pictures and advanced functions using the intelligent digital technique nurtured in the HDK series. Furthermore, we succeeded to create a small, light-weighted camera system whose weight and balance has been sought for the improvement of the portable camera operation.

- A 16-bit (65,535 gradation) A/D converter produces pictures with a broader range of gradation from darker parts to highlighted parts.

1.1 Features of This Product

Fusion of High Quality CCD and Superb Image Processing Techniques

■ 2.3 Million pixel new interlace 3CCD

A 2.3-million pixel 2/3-inch AIT type 1080i CCD is employed to achieve superb picture quality with a horizontal resolution of 1,000 TV lines and an S/N ratio of more then 60dB.

■ Newly developed digital process IC

16-bit A/D conversion and new digital processing (computation) within the camera digitizes not only video signals but also nonlinear image processing used for the white shading correction and Gamma correction. This always achieves high quality pictures, advanced functions, and high reliability with stability.

Support of Various Picture Expressions

■ DTL Correction

Includes a horizontal and vertical DTL correction circuit in which red, green and blue video are independently digitally processed.
You can obtain the full resolution HDTV picture quality with little noise even in the stand-alone VTR shooting.

■ Wideband Digital DTL

Includes an advanced digital DTL circuit to improve reproduction, including texture and sheen. Furthermore, improves richer reproduction of details with little noise in dark background and details in skin tone.

■ Focus Assist Function

A focus assist area is provided in the VF image to aid the cameraman in finding the focus. The focus assist area can only be displayed during focusing when operation of the lens focus ring or operation of the focus switch, etc. act as a trigger.

■ Six-axis + Two-axis Color Corrector

Includes a color corrector function that enables you to adjust hue and saturation of six primary colors (R, G, B, cyan, yellow, magenta).
Also, includes a color corrector function to adjust two selected colors.

■ Super KNEE

Includes a super KNEE function which produces the KNEE process with less saturation loss, and without changing the hue of the highlighted parts. Produces a more natural highlight appearance, rather than washing out the color.

Pursuit for Superb Operation and Ease of Use

■ *Application of Conventional Standard 2/3-inch Lenses*

As the lens mount, BTA S-1005B is used. You can use not only HD lenses but also SD camera lenses for SDTV portable cameras as they are.

■ *High Performance Viewfinders*

You can select from 9-inch LCD color V or 7-inch HD CRT B/W VF.

■ *Low Center of Gravity*

The operability for the camera operator is improved by the design with making the viewfinder position close to the optical axis and reducing the overall height to lower its center of gravity.

■ *On-Line Diagnostics*

An on-line diagnostic system enables monitoring the status of circuits including video, control, fiber optic transmission, pulses and power supply. This enables you to always grasp the status information of the camera.

■ *Rotating Camera Cable Connection*

Employs a rotating fiber camera cable connector. This enables studio shooting and field shooting at various angles.

■ *Return Switch*

The rear operation panel has RET-1, RET-2, and RET-3 as part of standard equipment. This allows you to switch easily between various RET signals.

Equipped with Various Interfaces

- The camera includes HD-SDI signal output.
- The camera has an interface for return video in HD-SDI signal form. (RET HD-SDI signal transmission)
- When the camera is connected to the CCU-970, you can use the data trunk channel (RS-422) for virtual studio applications.
- An 8-core composite fiber optic camera cable (two single-mold fibers, four power leads, two control signal leads) connects between the camera and the CCU-970, and the transmission complies with BTA S-004A (Japan standard) and SMPTE292M (International standard). The distance of signal transmission and power supply allows up to 2,000 m by multiple connections (up to 12 connections) of composite fiber optic cables (9.2 mm diameter).
- It is possible to supply the AC power as UTILITY power output. (200 VA Max.)

Support Function for Data Setup

The level adjustment and settings of each menu for the camera can be easily set up by calling up the ENGINEER SET FILE that is set by user engineer or the FACTORY SET FILE that is set at shipment according to environment or shooting conditions where the camera system is used. This enables to initialize the camera status quickly even though the settings are changed due to causes such as wrong operation of the menu.

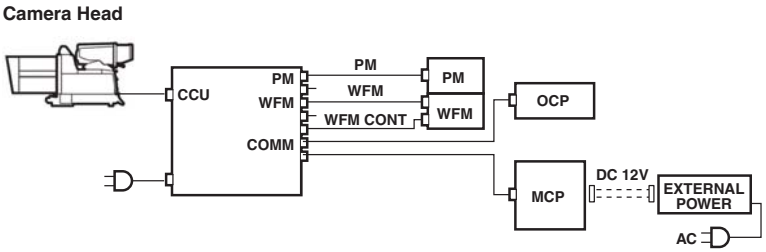
Reference:

See “6. TROUBLE SHOOTING and MAINTENANCE [Initializing the Settings of this Product]” for the ENGINEER SET FILE and FACTORY SET FILE.

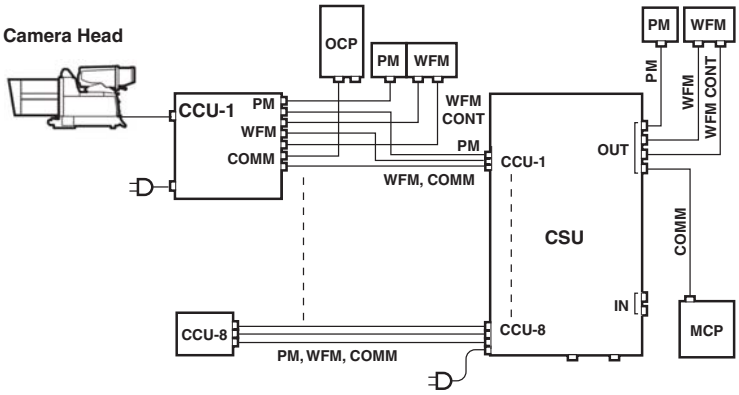
1.2 Operating Systems

This product is equipped with interface functions with a control panel and control unit. It supports various operation forms in the studio or field as a system camera with the combination of CCU-970.
Each control panel to be connected to the CCU can be selected and operated depending on the use.

■ *Example of Minimum Configuration of System Camera (1 camera, 1 OCP, 1 MCP)*



■ *Example of System Camera Configuration (Up to 8 cameras, 1 MCP)*



Note:

For Minimum operating System, no MCP needed when OCP-200 is used.
When any MCP other than MCP-200 is used, EXTERNAL POWER is not necessary, and the CP cable length is 300m at the maximum.

Term:

OCP (Operation Control Panel)
This control panel is used for normal operation. Typically one OCP is dedicated to one camera chain.

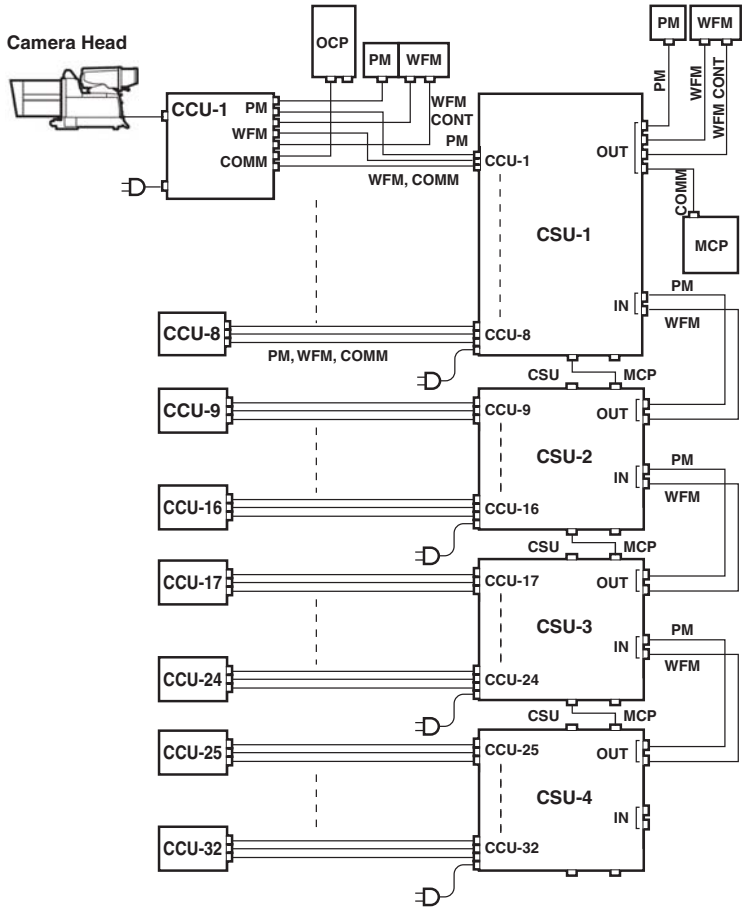
Term:

MCP (Maintenance Control Panel)
This control panel is used for the maintenance and precise adjustment of the camera in studio shooting. By using a memory card, you can save the shooting condition on memory and make setup easily. By using a CSU together with an MCP, you can maintain up to 32 cameras.

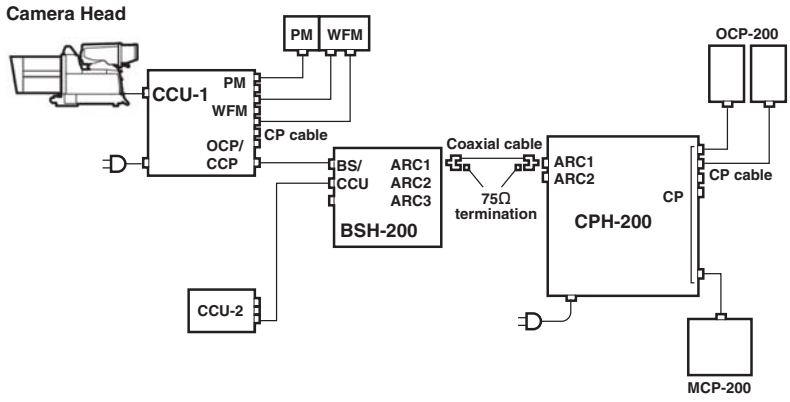
Term:

CSU (Camera Select Unit)
Used when controlling multiple cameras. With using a MCP, one CSU can control up to 8 cameras, and contains terminals through which video is output on the monitor from the selected camera.

■ *Example of Minimum Configuration of System Camera (Up to 32 cameras and 1 MCP)*



■ *Network Connection (Basic bus connection)*



Note:

- The OCP/CCP connector and MCP/CCP connector on the CCU cannot be used with the network connector at the same time in this configuration.

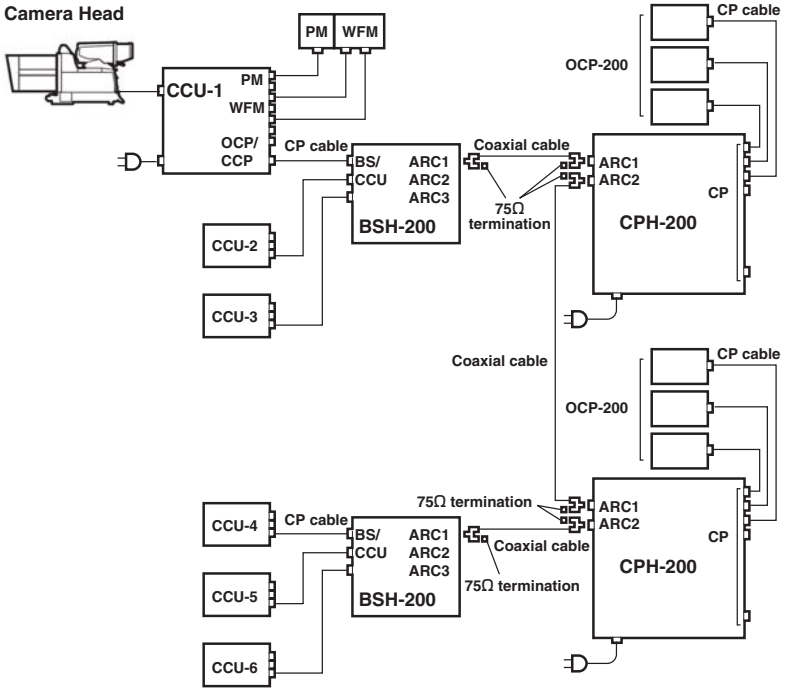
Term:

CPH (Control Panel Hub)
The hub for network used with connecting to a network-adaptive control panel.

Term:

BSH (Base Station Hub)
It is designed as the HUB unit of which employs command converter for Ikegami's non-network capable camea head/ BS/CCU to use under network control system.

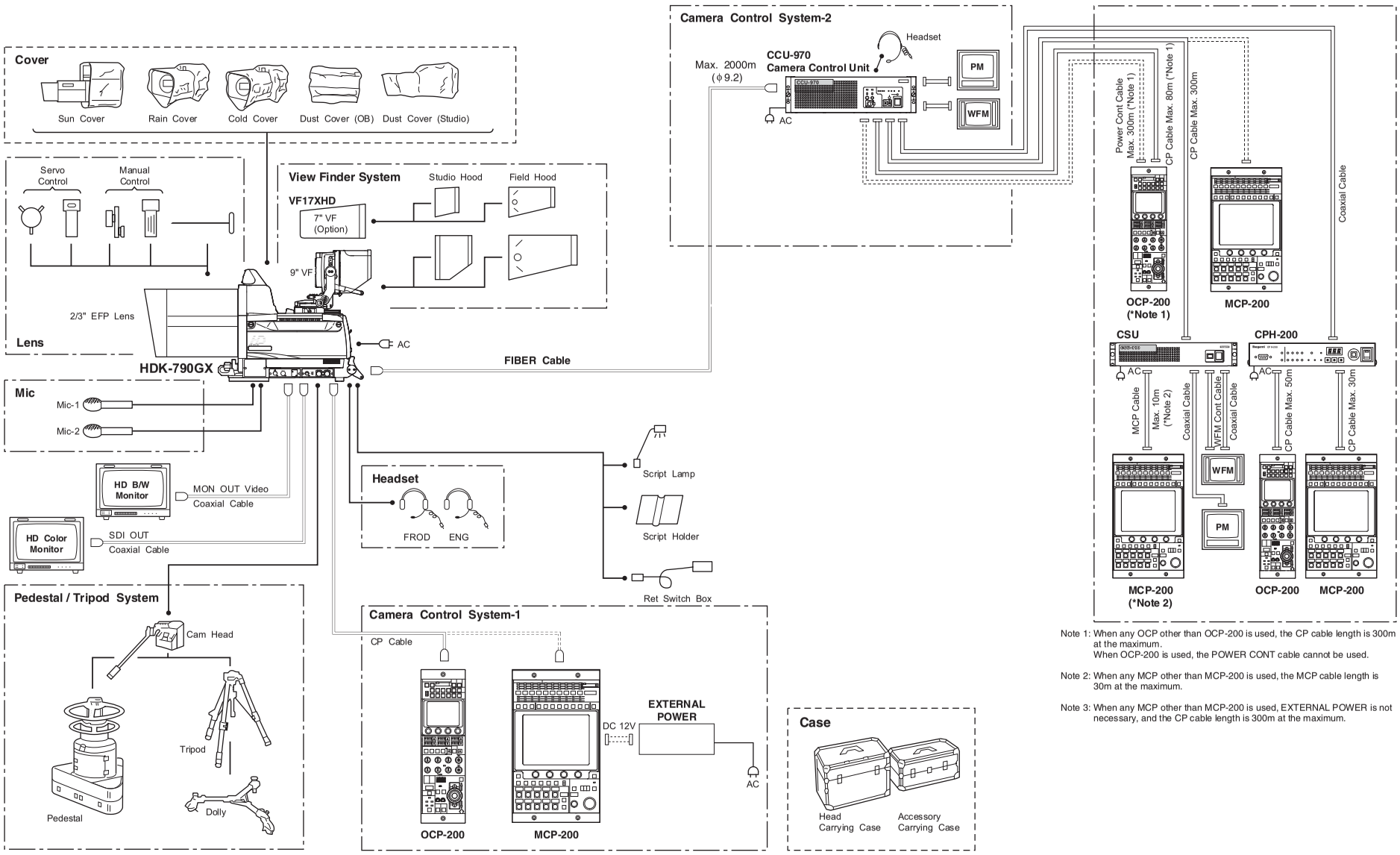
■ *Network Connection (Expansion bus connection)*



Note:

- The OCP/CCP connector and MCP/CCP connector on the CCU cannot be used with the network connector at the same time in this configuration.

1.3 Connection Diagram



Note 1: When any OCP other than OCP-200 is used, the CP cable length is 300m at the maximum.
When OCP-200 is used, the POWER CONT cable cannot be used.

Note 2: When any MCP other than MCP-200 is used, the MCP cable length is 30m at the maximum.

Note 3: When any MCP other than MCP-200 is used, EXTERNAL POWER is not necessary, and the CP cable length is 300m at the maximum.

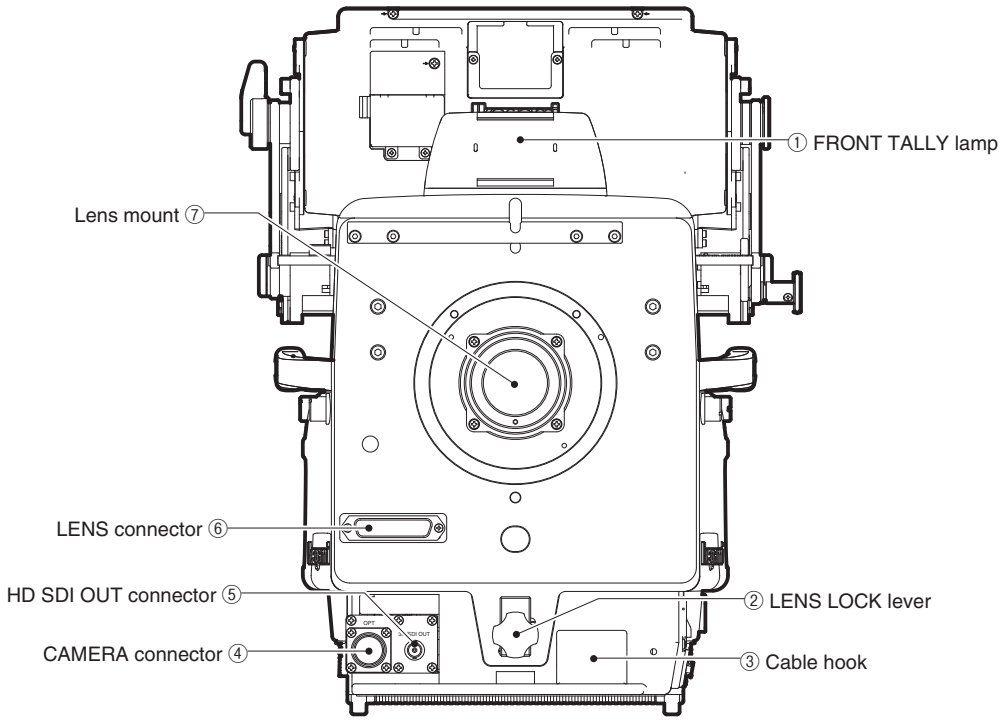
2

NAME and FUNCTION

2.1 Camera and Viewfinder

This section explains the names and functions of the parts on the camera and viewfinder.

Camera Front View



① FRONT TALLY lamp

FRONT TALLY lamp lights up when the RED TALLY (On Air Tally) signal is input.
It also lights up when the CALL button is pressed on the CCU or control panel.

② LENS LOCK lever

After installing the lens to the camera, secure the lens with a lens fixing knob.

③ Cable hook

Hook the camera cable on the cable hook to secure it.

④ CAMERA connector

Connect the camera and CCU with a fiber cable. It supports connectors of LEMO 3K series and Tajimi OPS series.

⑤ HD SDI OUT connector

This is an output connector for the HD SDI signal. It can be treated as a main line signal for the self-contained operation and a MON OUT signal for the CCU operation.

⑥ LENS connector

Connect with the connector on the lens side when installing the lens.

⑦ Lens mount

You can use various 2/3-inch broadcast lenses. The BTA mount system is equipped as a standard lens mount.

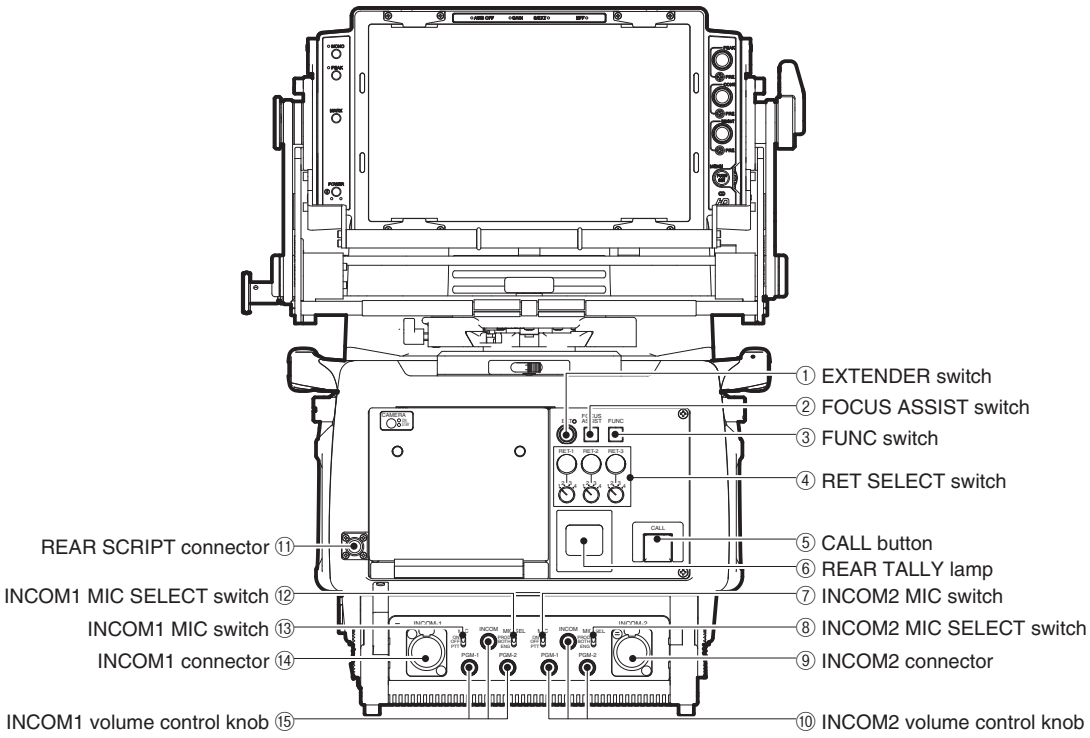
Reference:

See “Safety Cautions” for the routing and fixing methods of fiber cables.

Reference:

See “7. Specification [7.4. External connection connector]” for pin functions of lens connector.

Camera Rear View



① EXTENDER switch

Turns ON/OFF the lens extender.

② FOCUS ASSIST switch

Turns ON/OFF the FOCUS ASSIST. The switch lights up when it is ON.
The intensity of light can be changed with the REAR TALLY switch on the rear control panel.

Caution:

If the REAR TALLY switch is set to OFF, the light does not turn on even when the FOCUS ASSIST function is turned ON.

③ FUNC switch

Turns ON/OFF the functions assigned in the menu. The switch lights up when it is ON.
The intensity of light can be changed with the REAR TALLY switch on the rear control panel.

Caution:

If the REAR TALLY switch is set to OFF, the light does not turn on even when the FUNC function is turned ON.

④ RET SELECT switch

Selects the RET signal to be output on the viewfinder.

RET-1 : Outputs the Return video-1 signal.
RET-2 : Outputs the Return video-2 signal.
RET-3 : Outputs the Return video-3 signal.
RET-1 selector switch : A switch used to select one of the return video signals as the RET-1 signal from the four lines that are connected to CCU.
RET-2 selector switch : A switch used to select one of the return video signals as the RET-2 signal from the four lines that are connected to CCU.
RET-3 selector switch : A switch used to select one of the return video signals as the RET-3 signal from the four lines that are connected to CCU.

When all return signals are selected simultaneously, the signals are output in the following sequence: RET-1 > RET-2 > RET-3.

⑤ CALL button

A button used to call VE (Video Engineer). When this button is pressed, the RED TALLY indicator on the CCU and control panel lights up and buzzer sounds.

⑥ REAR TALLY lamp

Supports RED/GREEN TALLY. RED/GREEN TALLY lights up independently.
RED TALLY lights up when the RED TALLY signal is input to the CCU, and then the CALL button is pressed from the CCU or control panel.
GREEN TALLY lights up when the GREEN TALLY signal is input to the CCU.
RED TALLY lights up when the RED and GREEN TALLY signals are input simultaneously. RED TALLY lights up when the CALL button is pressed while GREEN TALLY is lit.

⑦ INCOM2 MIC switch

ON/OFF switch of the intercom microphone for INCOM2.
ON : Turns ON the intercom microphone.
OFF : Turns OFF the intercom microphone.
PTT : Turns ON the intercom microphone while this switch is pressed.

⑧ INCOM2 MIC SELECT switch

Select switch of the intercom microphone for INCOM2.
PROD : Selects the line of microphone for the intercom system for Producer.
BOTH : Selects the line of microphone for the intercom system for both Producer and Engineer.
ENG : Selects the line of microphone for the intercom system for Engineer.

⑨ INCOM2 connector

A connector used to connect the headsets for INCOM2.

⑩ INCOM2 volume control knob

A knob used to adjust the volume of intercom receiver for INCOM2.
INCOM : A knob used to adjust the volume of intercom receiver for INCOM-2.
PGM1 : A knob used to adjust the volume of PGM1 for the intercom system for INCOM-2.
PGM2 : A knob used to adjust the volume of PGM2 for the intercom system for INCOM-2.

⑪ REAR SCRIPT connector

Connects the SCRIPT lamp.

⑫ INCOM1 MIC SELECT switch

Select switch of the intercom microphone for INCOM1.
PROD : Selects the line of microphone for the intercom system for Producer.
BOTH : Selects the line of microphone for the intercom system for both Producer and Engineer.
ENG : Selects the line of microphone for the intercom system for Engineer.

⑬ INCOM1 MIC switch

ON/OFF switch of the intercom microphone for INCOM1.
ON : Turns ON the intercom microphone.
OFF : Turns OFF the intercom microphone.
PTT : Turns ON the intercom microphone while this switch is pressed.

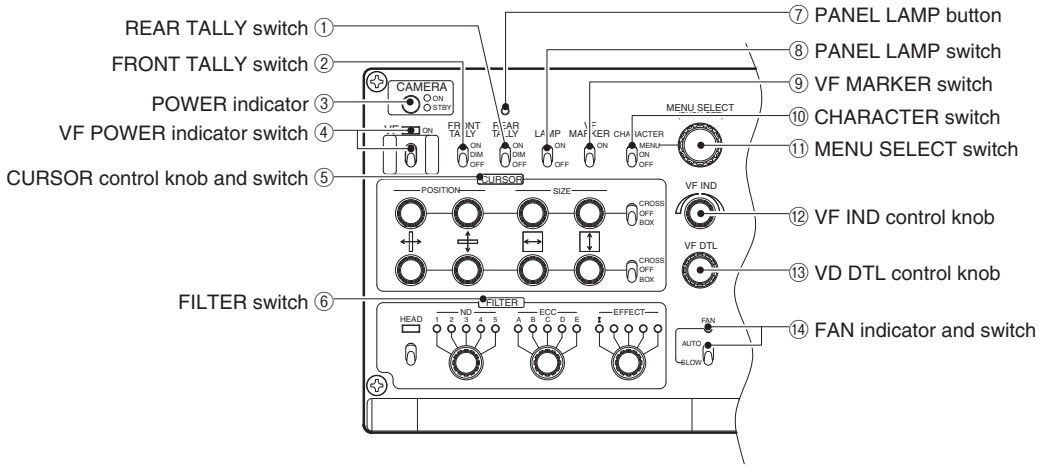
⑭ INCOM1 connector

A connector used to connect the headsets for INCOM1.

⑮ INCOM1 volume control knob

A knob used to adjust the volume of intercom receiver for INCOM2.
INCOM : A knob used to adjust the volume of intercom receiver for INCOM-1.
PGM1 : A knob used to adjust the volume of PGM1 for the intercom system for INCOM-1.
PGM2 : A knob used to adjust the volume of PGM2 for the intercom system for INCOM-1.

Rear view camera control panel



① REAR TALLY switch

A switch used to turn ON/OFF the lights of REAR TALLY lamp, FOCUS ASSIST switch, and FUNC switch.

ON : Turns on the lamp.
DIM : Turns on the lamp with a reduced light intensity.
OFF : Turns off the lamp.

Caution:

If it is set to OFF, the lamp does not turn on even when the function of switch for each lamp is turned ON.

② FRONT TALLY switch

A switch used to turn ON/OFF the FRONT TALLY lamp.

ON : Turns on the lamp.
DIM : Turns on the lamp with a reduced light intensity.
OFF : Turns off the lamp.

③ POWER indicator

Displays the status of camera power supply.

ON (green) : Lights up when the HEAD POWER switch is “ON”.
STBY (red) : Lights up when the camera is in standby. (When the HEAD POWER switch of the camera or CCU is “OFF”)

“Standby” status during the CCU operation means that transmission voltage (AC 30V) is sent from the CCU to camera, and the standby INCOM system is activated.

④ VF POWER indicator switch

Turns ON/OFF the viewfinder (VF).
The VF POWER switch is a momentary type switch. The indicator lights up when the VF is turned “ON”.

⑤ CURSOR control knob and switch

Selects the cursor to be displayed on the viewfinder screen with the CURSOR switch.

CROSS : Displays a cross cursor.
OFF : Does not display a cursor.
BOX : Displays a box cursor.

Use the CURSOR control knob to control the position of cursor and the size of box cursor.

⑥ FILTER switch

A switch used to select the filter position.

● ND (Neutral Density) FILTER switch

A switch used to select the ND filter from the camera side.

1 : 100%
2 : 25%
3 : 6.2%
4 : 1.6%
5 : CAP

● ECC (Electric Color Conversion) FILTER switch

A switch used to select the ECC filter from the camera side.

A : 3200K
B : 4300K
C : 5600K
D : 6300K
E : 8000K

● EFFECT (Effect) FILTER switch

A switch used to select the EFFECT filter from the camera side.

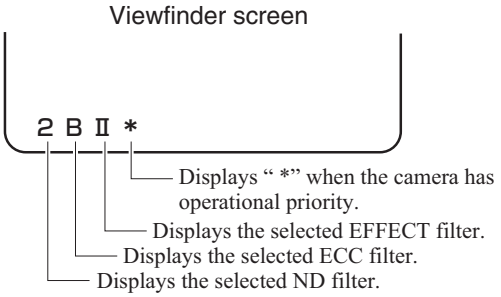
Ⅰ : CLEAR
Ⅱ : CROSS
Ⅲ : SNOW CROSS
Ⅳ : FOGGY
Ⅴ : CLEAR

● FILTER HEAD switch

A switch used to switch the settings for each filter from the camera side. If an operation is enabled on the camera side during the CCU operation, the "*" mark and the selected filters will be displayed on the left bottom corner of the viewfinder screen.

● FILTER local indicator

Lights up when the filter operation is enabled on the camera side.



⑦ PANEL LAMP button

A button used to turn off the lamp for the panel when the rear cover is closed.
The lamp is turned off when the panel lamp switch is "ON" (when the panel lamp is lit), and then the rear cover is closed.

⑧ PANEL LAMP switch

A switch used to turn ON/OFF the lamp of camera control panel.

⑨ VF MARKER switch

Displays the safety marker (16:9/4:3), safety area (action, title area), center marker, frame marker (16:9/4:3) on the viewfinder screen.

⑩ CHARACTER switch

Displays various information with characters on the viewfinder.

MENU : Displays the information for when it is "ON" as well as the special items such as camera work time, and sets various menu settings.
ON : Displays the filter position and shutter speed (when the shutter function is turned ON).
OFF : Does not display information.

The information will be displayed when performing the AUTO SETUP, and the warning will be also displayed even if the switch is set to "OFF".

⑪ MENU SELECT switch

A switch used to select the menu and confirm the setting value when it is in the MENU mode with the CHARACTER switch.

⑫ VF IND control knob

A knob used to change the brightness of cursor and markers to be displayed on the viewfinder screen.
Turn it left to make it darker, and turn it right to make it brighter.

⑬ VD DTL control knob

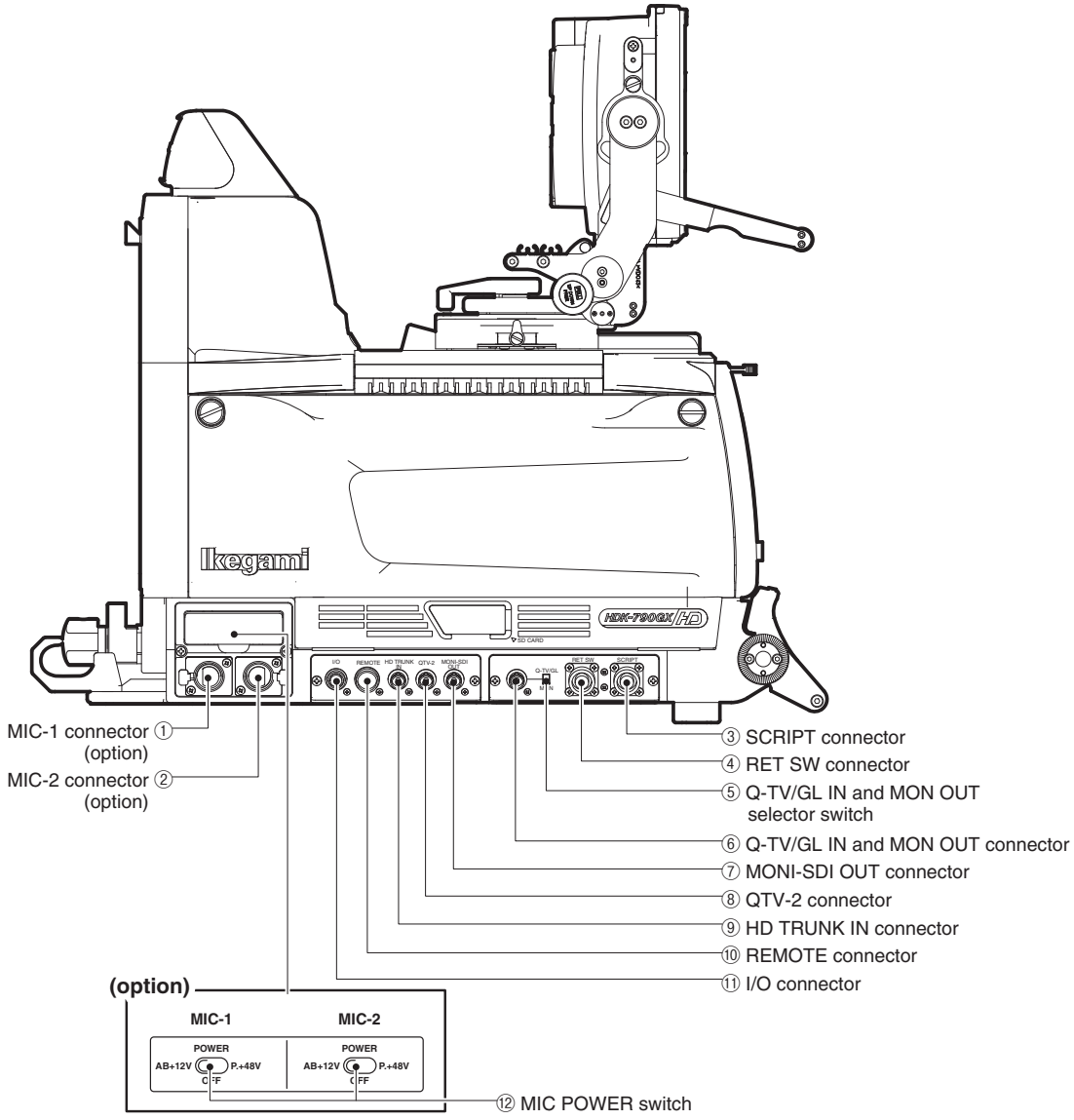
A knob used to control the edge level of DTL correction for the viewfinder image.

⑭ FAN indicator and switch

Cooling fans are equipped at the bottom of camera and in the HEAD POWER BOX module to prevent the temperature from increasing inside the camera. This switch is used to control these cooling fans.

AUTO : Automatically controls the speed of fan (high or low speed) according to the inside temperature.
SLOW : Turns on the fan at the low speed. If a sense of serenity is required upon the operation, press down the switch for 2 seconds. The indicator lights up, and then it returns to the AUTO mode after 5 minutes.

Camera Right View



① MIC-1 connector (option)

A connector used to connect the microphone and input the audio signal for line output.

② MIC-2 connector (option)

A connector used to connect the microphone and input the audio signal for line output.

③ SCRIPT connector

A connector used to connect the SCRIPT lamp.

④ RET SW connector

A connector used to connect the return switch box.
You can select the MIC ON/OFF, and LENS EXT-1/EXT-2 for RET-1, RET-2, and INCOM1/INCOM2.

⑤ Q-TV/GL IN and MON OUT selector switch

A switch used to select the I/O signals for the Q-TV/GL IN and MON OUT connectors.

⑥ Q-TV/GL IN and MON OUT connector

A connector used to output the selected signals using the Q-TV/GL IN and MON OUT selector switch.

- When it is set to “Q-TV/GL”
  Changes the analog video signal that is input into the Q-TV connector on the back of CCU to the Q-TV signal (video trunk input) for the monitor to output. The Q-TV signal output function is supported only during the CCU operation.
  It inputs the PS/S signal (tri-level sync signal) as an external sync signal (genlock input). The external sync signal input is supported only during the self-contained operation.

- When it is set to “MON OUT”
  Outputs the monitor signal. Select the MON and SYNC signals from the camera menu.

⑦ MONI-SDI OUT connector

A connector used to output the HD SDI signal.
Select the VF, MAIN, RETURN, and HD Q-TV signals from the camera menu.

⑧ QTV-2 connector

A connector used to output the QTV-2 signal.

⑨ HD TRUNK IN connector

A connector used to input the HD TRUNK signal (1.5G-SDI).
The input 1.5G-SDI signal can be output from the connector on the back of CCU.

Caution:

The HD TRUNK output for the CCU-970 is optional.

⑩ REMOTE connector

A connector used to connect the various remote control panels (OCP, MCP, RCP) and communicate the various control signals during the self-contained operation.

⑪ I/O connector

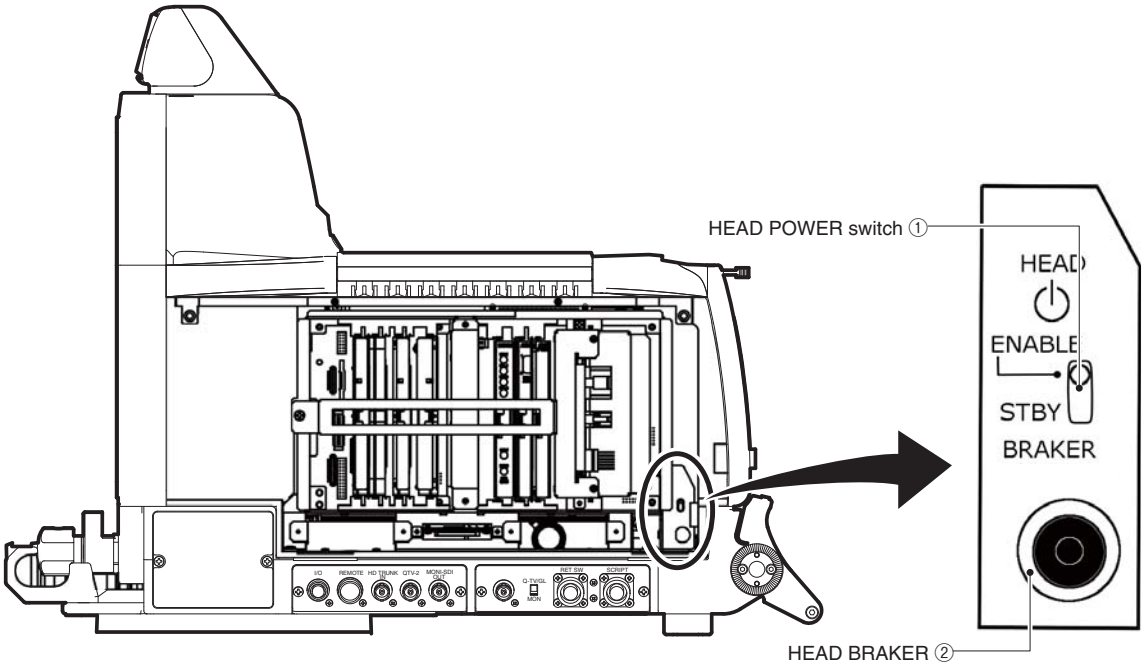
A multi-connector that includes the GREEN/RED TALLY control output signal, RET-1 and RET-2 control input signals, and RS-422 data control signal, etc.

⑫ MIC POWER switch (option)

A switch to change the power supply for the microphone that is connected to the MIC-1and MIC-2 connectors.
Select it depending on the type of microphone to be used.

AB+12V : Supplies power to the microphone for +12V AB power.
OFF : Does not supply power to the microphone. If the dynamic microphone or microphone includes a built-in power supply and does not require power supply, use it in this position.
+48V : Supplies +48 V phantom power to the microphone.

■ *Camera inside the right side plate*



① HEAD POWER switch

A switch used to turn ON/OFF the camera. Normally it is set to “ON”.

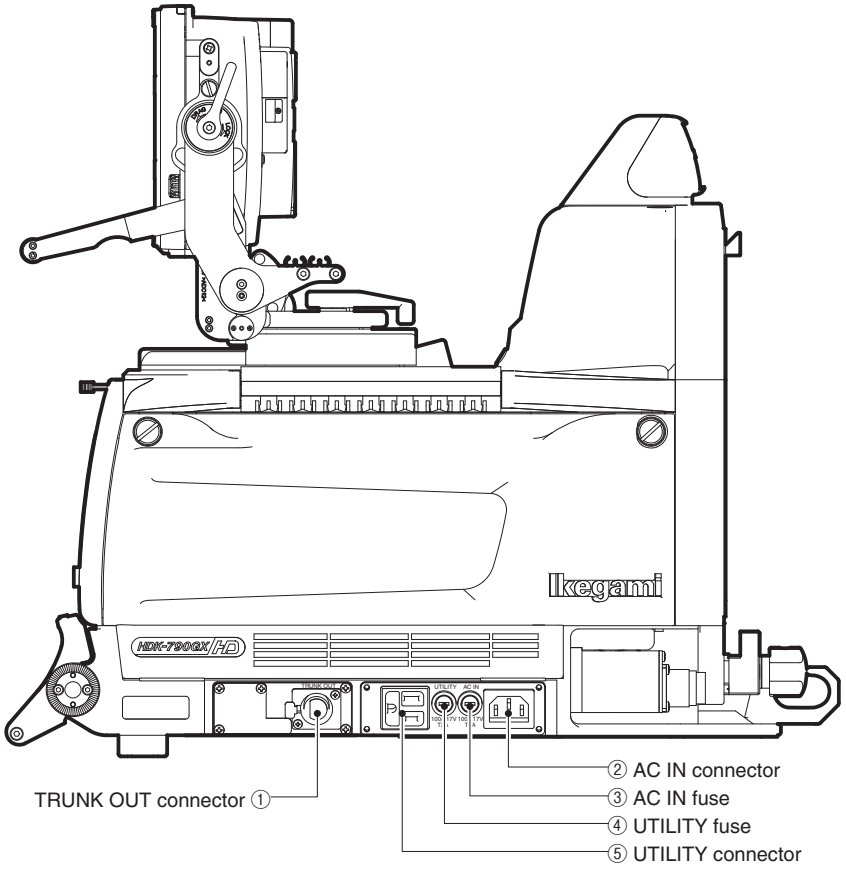
Caution:

Turning off this switch will not turn off the STBY power.
When inserting or removing the module, make sure to turn off the STBY power before operating it.
Turn off the CCU and then turn off the STBY power for the CCU operation.
Remove the AC IN connector and then turn off the STBY power for the self-contained operation.

② HEAD BRAKER

A breaker for the module power supply inside the camera.

Camera Left View



① TRUNK OUT connector

A connector to output the AUDIO TRUNK signal that has been sent from the CCU.

② AC IN connector

Supplies AC power to the camera during the self-contained operation.

③ AC IN fuse

A fuse for the AC input power supply to the camera (voltage rating: 100/117V-4A, 220/240V-2A).

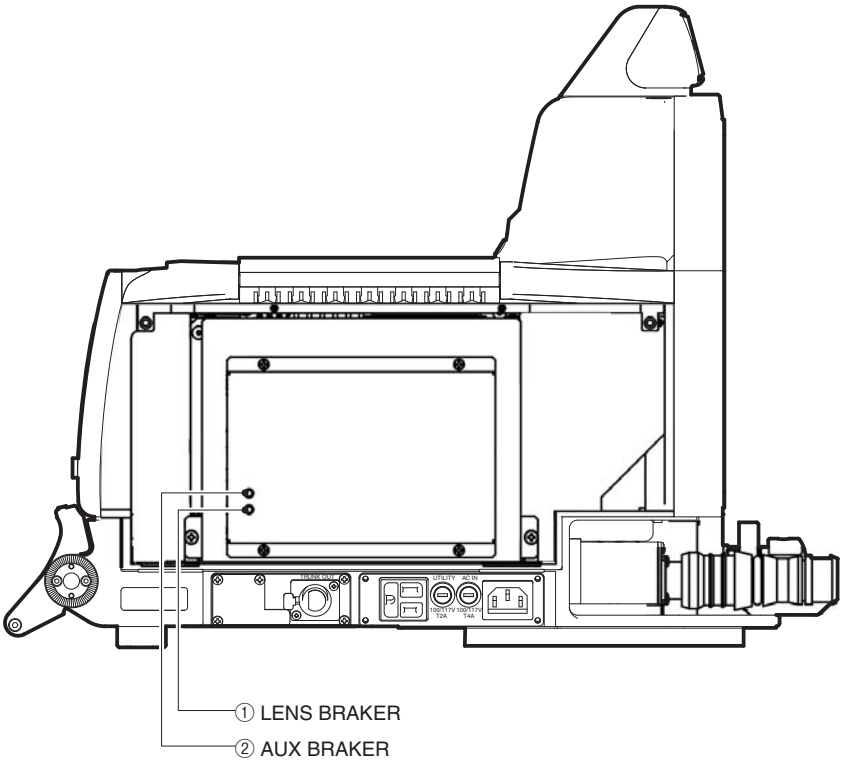
④ UTILITY fuse

A fuse for the general AC output power supply (voltage rating: 100/117V-2A, 220/240V-1A).

⑤ UTILITY connector

A connector for the general AC power supply.
The output voltage is set to the voltage you are using at the time of shipment.
Supported voltage: 100/117/220/240V

■ *Camera inside the left side plate*



① LENS BRAKER

A breaker for DC +12V power that is supplied to the lens.

② AUX BRAKER

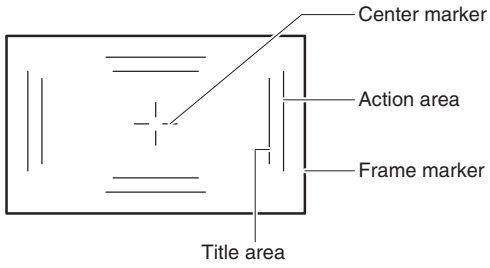
A breaker for DC +12V power that is supplied to the LCD viewfinder, SCRIPT lamp, I/O connector, REMOTE connector, etc.

2.2 Displays in the Viewfinder

Various markers and characters are displayed in the viewfinder (VF).

Center Marker, Safety Marker, Frame Marker

- The Center Marker is used to ascertain the center of the screen or align the camera horizontally and vertically.
- The Safety Markers are used to check the action safety area or title safety area. Switching between the action area and the title area is made from the menu.
- The Frame Marker is used to ascertain the frame of the image being shot.
- Aspect ratio (4:3/13:9/14:9/16:9) can be set to the Safety Markers and Frame Marker separately.

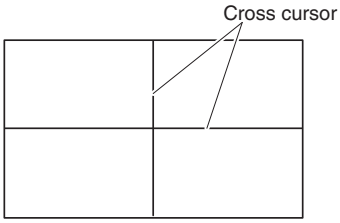


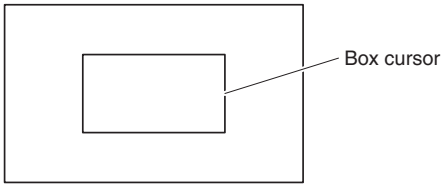
Reference:

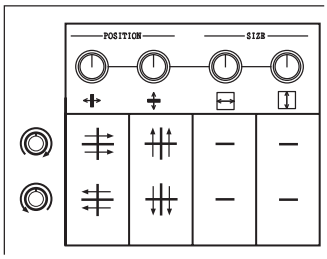
See "5. Camera settings and adjustments [VF DISPLAY]" for the display settings of each marker.

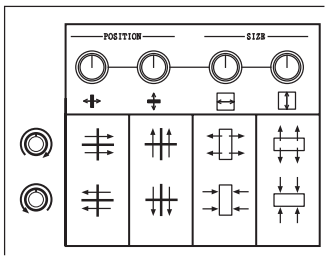
Cross cursor, Box cursor

- Cross cursor is used to adjust the horizontal and vertical positions of camera or position the subject.
- Box cursor is used as a guide to compose the shot of a subject or trim the screen.

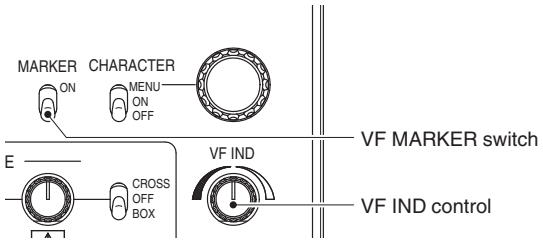








Use the CURSOR control on the camera control panel to change the position and size.



CAMERA control panel

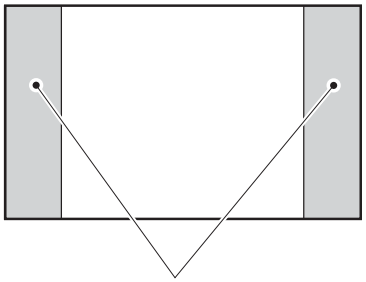
- VF MARKER switch : A switch used to turn ON/OFF various markers.
- VF IND control : A knob used to adjust the contrast level of a cross, box cursor, and characters, etc. Turning it to the left makes it darker, and turning it to the right makes it brighter.

Side Mask Function

When the camera output aspect ratio is set to 16:9, the picture on the viewfinder is displayed with a 16:9 aspect ratio. In consideration of converting to a 4:3 picture, the contrast of the picture outside the frame marker area can be adjusted. The side mask is displayed when the frame marker is set to the following ratio:
- With 16:9 mode : 4:3, 13:9, 14:9, 15:9

Reference:

See "5. CAMERA SETTINGS and ADJUSTMENT [Menu Configuration and content]" for how to set the side mask.



Brightness of the picture outside the frame marker can be adjusted.

Display Mode

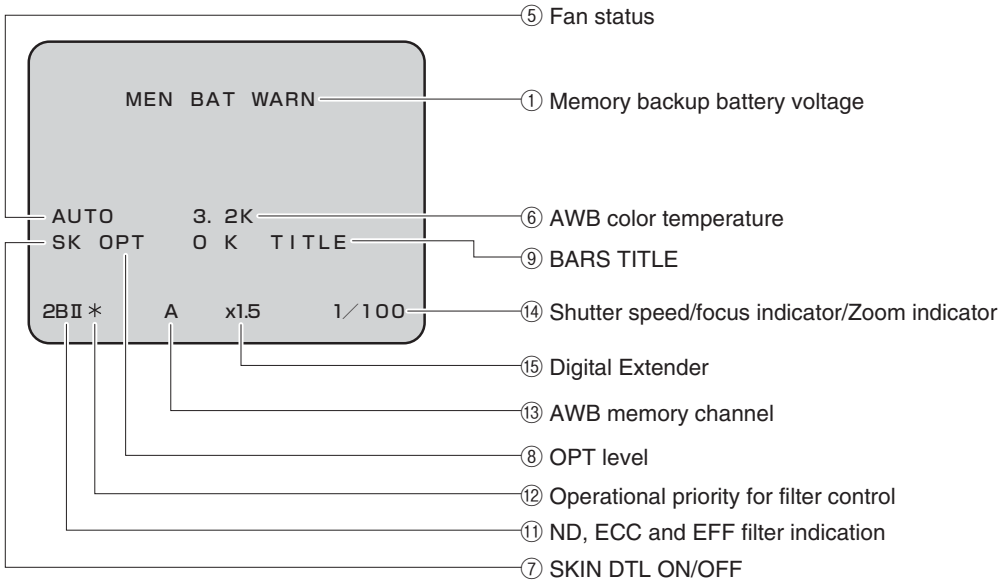
The display mode sets the markers and characters to be displayed in the viewfinder.

Reference:

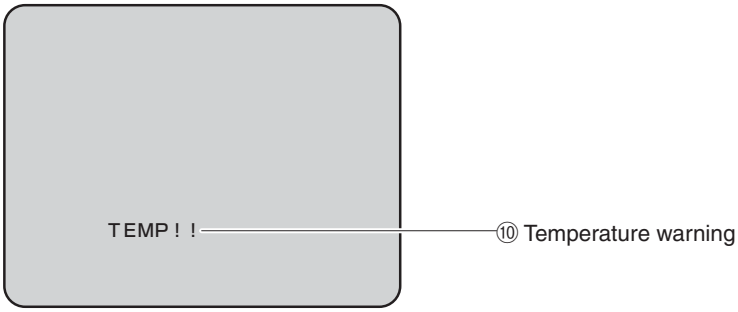
See "5. CAMERA SETTINGS and ADJUSTMENT [Menu Configuration and content]" for the display mode is set from the menu.

Viewfinder Display

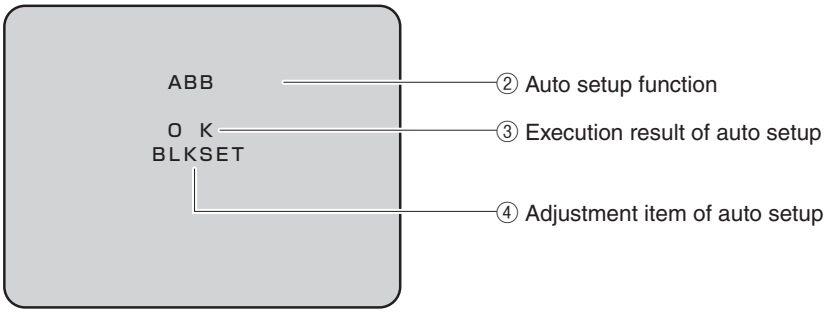
■ *Status Display*



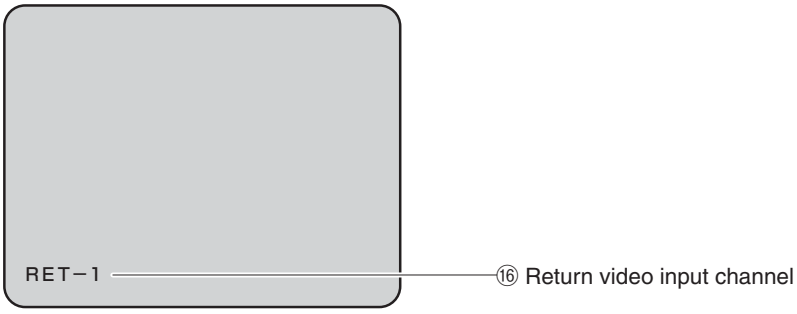
■ *Warning Display*



■ *Auto Setup Display*



■ *Return Video Channel Display*



① Memory backup battery voltage
The warning message is displayed for 5 seconds when the voltage of the backup battery in the MPU module has dropped.

② Auto setup function
Executing auto setup function is displayed.
“AWB”
“ABB”
“FULL SETUP”
“LEVEL SETUP” etc.

③ Execution result of auto setup
Execution result of auto setup (AWB and ABB, including) is displayed.

OK	: Auto setup has been completed.
NG	: Auto setup was not completed.
STOP	: Auto setup was discontinued.
LEVEL OVER	: Input signal level is too high.
LEVEL UNDER	: Input signal level is too low.
CHG FILTER	: Optical filter is not appropriate.

④ Adjustment item of auto setup
The item to which adjustment is being made is displayed during auto setup.
“FLARE GAMMA GAIN”
“PED”
“IRIS” etc.

⑤ Fan status
The fan status is displayed.

AUTO	: Fan is in the AUTO mode. Displayed when the VF CHAR button is pressed.
SLOW	: Fan is in the SLOW mode. Displayed when the VF CHAR button is pressed.
QUIET	: Fan is in the QUIET mode. Displayed when the VF CHAR button is pressed.
STOP	: Fan is in the STOP mode. Displayed when the VF CHAR button is pressed.
FAN!!	: Displayed flashing when the fan has stopped abnormally.

⑥ AWB color temperature
The color temperature stored in A-ch or B-ch memory is displayed for 2 seconds when the AWB/ABB switch is operated. (Selection between A-ch and B-ch is made by the AWB SELECT switch.) The AWB color temperature is also displayed when the FILTER switch is operated.

⑦ SKIN DTL ON/OFF
“SK” is displayed when the SKIN DTL function is ON.

⑧ OPT level
Optical signal level of the fiber cable is displayed when the CCU is connected to the camera. When the optical signal level is normal, “OPT OK” is displayed for 2 seconds.

⑨ BARS TITLE
The bar title is displayed when the color bar is output.

⑩ Temperature warning
This warning is displayed when the temperature of the inside of the camera is high.

⑪ ND and CC filter numbers

ND	1	2	3	4	5
	100%	25%	6.2%	1.6%	CAP
ECC	A	B	C	D	E
	3200K	4300K	5600K	6300K	8000K
EFF	Ⅰ	Ⅱ	Ⅲ	Ⅳ	Ⅴ
	CLEAR	CROSS	SNOW	FOG	—

⑫ Operational priority for filter control
“*” is displayed when the camera has the operational priority for the filter control.

⑬ AWB memory channel
The memory selected by the AWB SELECT switch is displayed.
A : A-ch memory
B : B-ch memory
O : White balance adjustment is in the preset condition (3200K).

⑭ Shutter speed/focus indicator/zoom indicator
The shutter speed or focus, zoom position is displayed.

⑮ Digital Extender
Magnification is displayed when the digital extender is ON.

⑯ Return video input channel
Input channel for return video is displayed.
RET-1 : Return video 1 is selected.
RET-2 : Return video 2 is selected.
RET-3 : Return video 3 is selected.
RET-4 : Return video 4 is selected.

3

INSTALLATION and CONNECTION

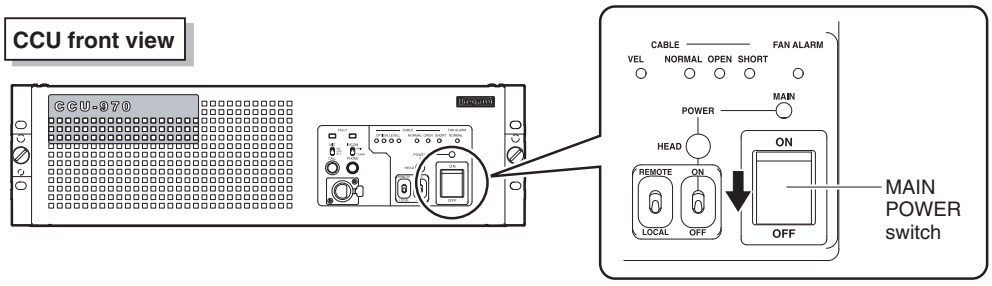
3.1 Preparation

Product Use Environment

Please read “SAFETY PRECAUTIONS” described at the beginning of this manual for precautions on use of this product.

Make sure the Power Switch is OFF

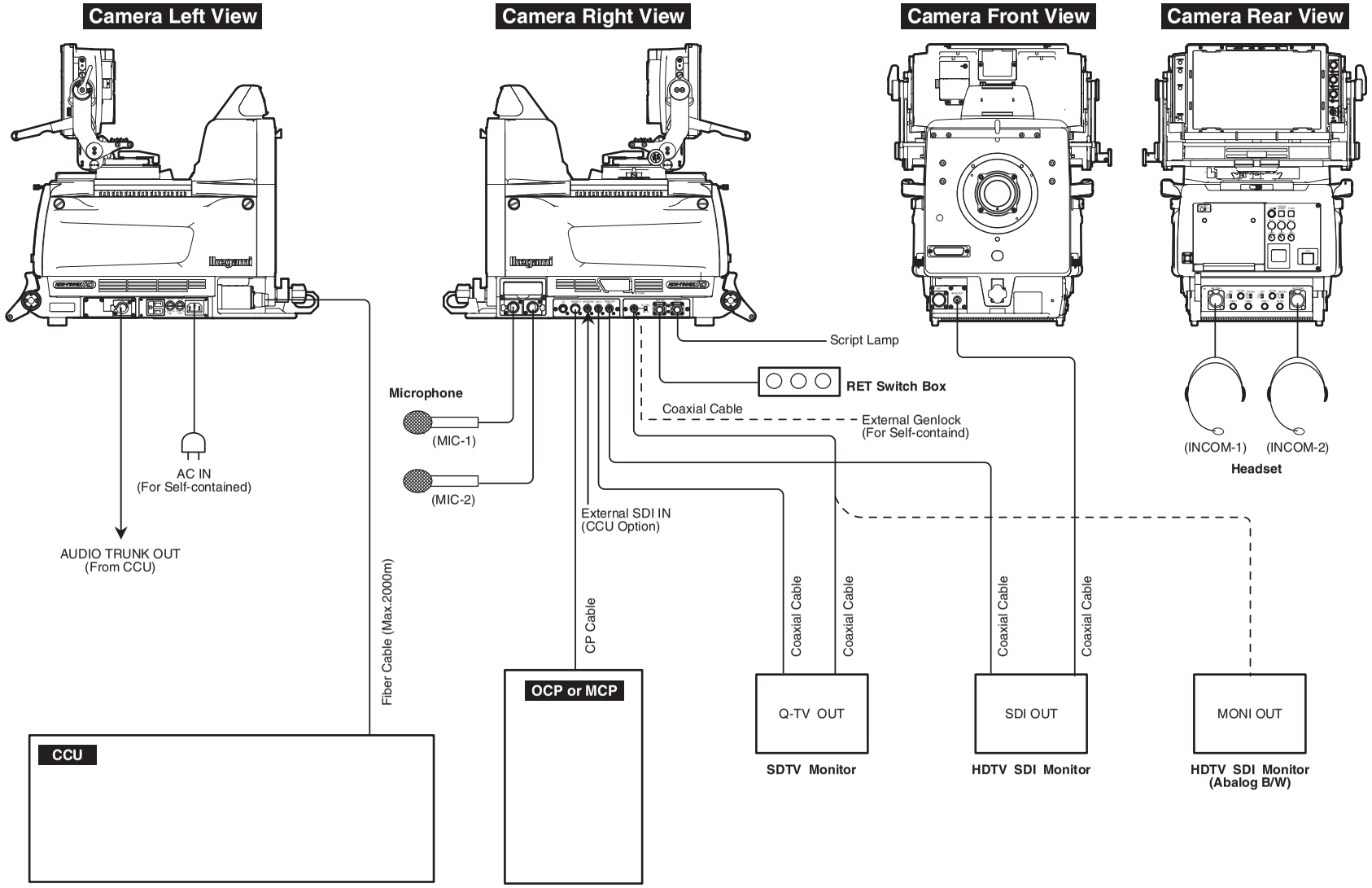
Please make sure that the power switch is “OFF” before connecting the camera and peripheral equipment such as the CCU.
If the camera is operated in the self-contained mode, make sure to remove the AC cable from the AC-IN connector of camera before connecting to peripherals.



Connection Example for Each Operating System

The HDK-790GX be used in various operating systems in studio and in field as a system camera in combination with peripheral equipment such as the CCU.
This section shows a connection example of each operating system. Please refer to these examples when you connect the camera, shooting equipment, and peripheral equipment.

■ *Cable Connection Diagram*



3.2 Camera and Peripheral Installation and Connection

Mounting/Removing the Camera on/from the Tripod

■ *Mounting the Camera on the Tripod*

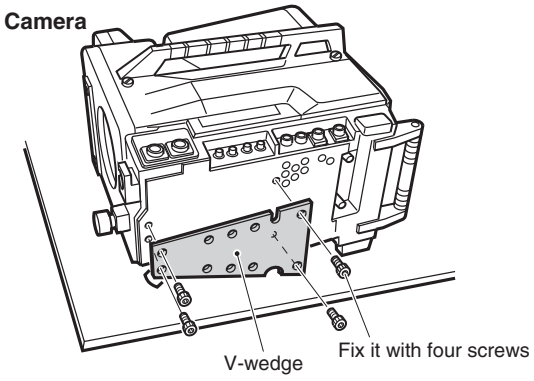
This section explains how to install a tripod on the camera. There are various types of tripods depending on the applications and purposes. See the user's manual of your tripod for details on the tripod.

Caution:

Make sure that two or more people carry and install or remove the camera. Working alone may cause unexpected injury or damage to the camera when you drop the camera.

1 Install a V-wedge to the camera.

If a user prepares a tripod for himself/herself, it is necessary to install a V-wedge on the camera.
Install a V-wedge on the predefined position and fix it with four screws.
The adjustment of the center of gravity by lens type is performed at the cam head on the tripod, so it is not necessary to perform the adjustment by moving the V-wedge mounting position.
However, if you cannot take the center of gravity by the cam head on the tripod, such as when you use an extra-large lens, adjust it by the balance plate using a mounting hole of V-wedge at the bottom surface.
See the bottom hole dimensions described in the next page.



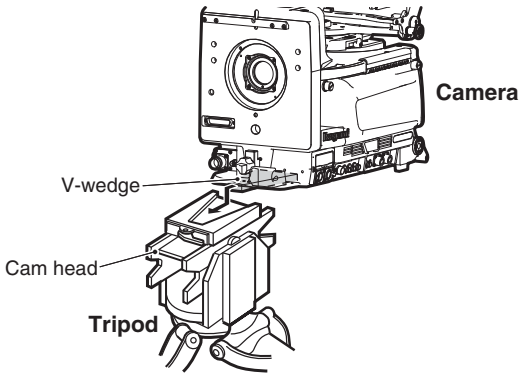
2 Fasten the fixing part and fix the legs of tripod.

3 Make sure that tilt lock and pan lock are applied.

If they are not locked and loose, tighten them.

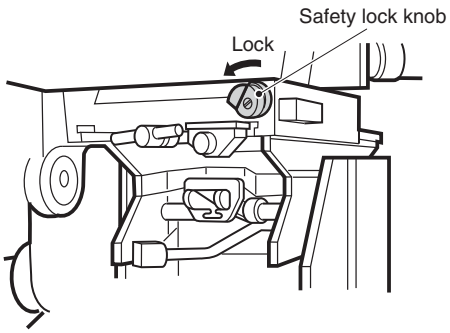
Caution:

If the tripod is unstable, the camera may fall when installing the camera and cause damage to the equipment or injury.



4 Lift the camera and press the V-wedge into the v-shaped groove of the cam head on the tripod.

5 Turn the safety lock knob of the cam head in a counterclockwise direction to lock.



6 Make sure that the camera is securely fixed to the tripod and nothing is rattling.

■ *Removing the Camera from the Tripod*

This section explains how to remove a tripod from this product.

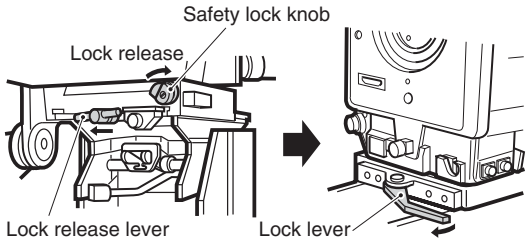
1 Turn the safety lock knob of the cam head on the tripod in a clockwise direction to release the lock.

2 Pull the lock lever toward you.

The lock that is fixing the camera from the both sides will be released.

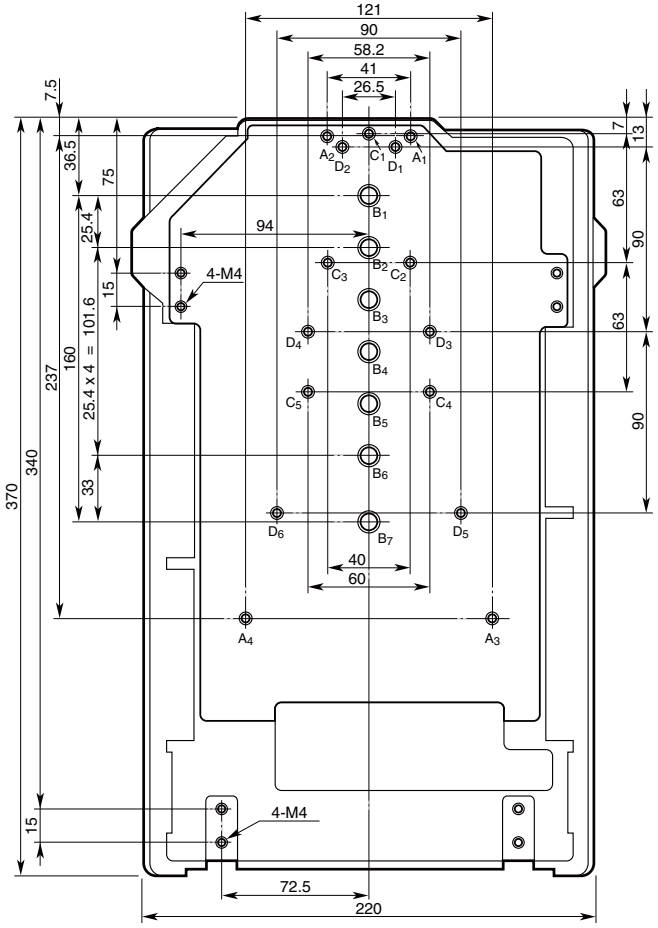
3 Pull the lock release lever and take out the camera.

Hold the grip when working so that the camera will not fall.



Front view

Unit : mm



The bottom of the camera

Symbol	Screw diameter	Tripod
$A_1 \sim A_4$	M5	VINTEN or equivalent
$B_1 \sim B_7$	3 / 8-16 UNC	ITE or equivalent
$C_1 \sim C_5$	M5	SHOTOKU TE-05/TE-12 or equivalent
$D_1 \sim D_6$	M5	SHOTOKU TE-02/TE-12 or equivalent

Mounting and Removing the Lens

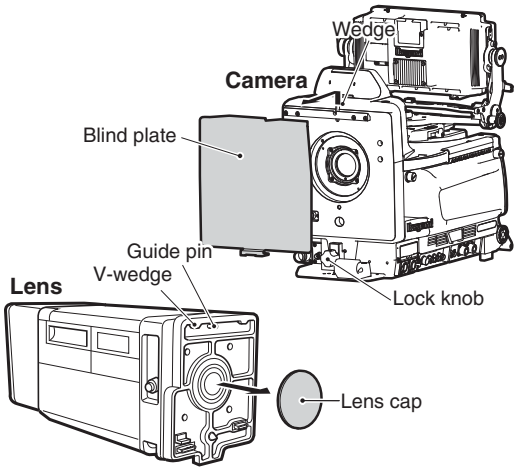
■ *Mounting the Lens*

This section explains how to install a lens on the camera.
Be sure to place the camera on a tripod when you mount the lens. The BTA mount system is equipped as a standard lens mount for the camera.

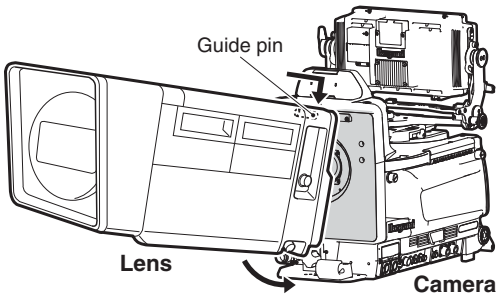
1 Lock the tilt lock of the cam head on the tripod and fix it securely so that the camera cannot move.

2 Turn the lock knob of the blind plate and release the lock.

Remove the blind plate and lens cap from the camera.



3 Place a lens on the camera by hooking the guide pin of lens in the wedge of camera. Align the connectors of the camera and lens and push in gently.

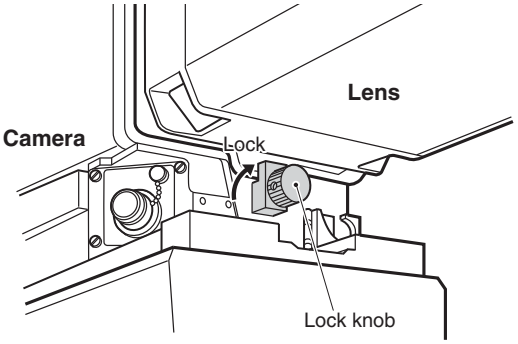


4 Turn the lock knob and fix the lens.

If the balance of camera is not stable, refer to the user's manual of the tripod to move the center of gravity of the camera.

Reference:

Lens file
The lens code number is configured by the switches on the lens side. By creating a lens file in advance according to the lens code number, the lens file can be switched automatically when the lens is replaced.
See “5. Setting with menu function [FILE SET]” for the method to set a lens code number of the lens and create a lens file.



■ *Removing the Lens*

This section explains how to remove a lens from the camera.

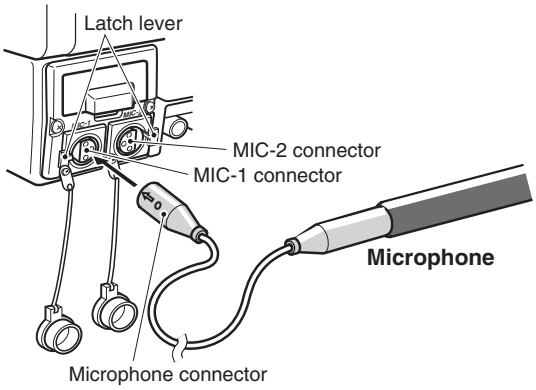
1 Lock the tilt lock of the cam head on the tripod and fix it securely so that the camera cannot move.

2 Remove the lens in a reverse order of mounting procedure.

Connecting the Microphone

This product is equipped with two microphone channels (MIC-1 and MIC-2). Select them depending on the operating conditions. The MIC AMP module is optional.

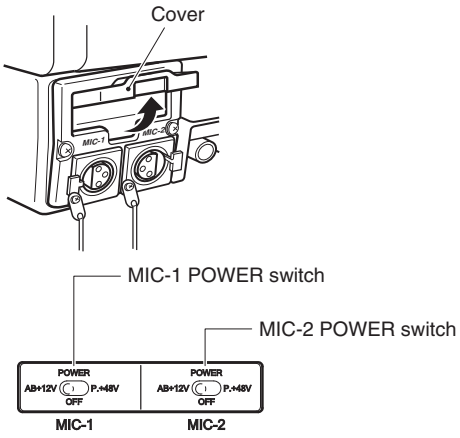
1 Connect the microphone connector to MIC-1 or MIC-2 connector.



2 Switch the power supply for the microphone.

Set the MIC-1 or MIC-2 POWER switch according to the power supply method of your microphone.
See the user's manual of your microphone for details on the microphone.

AB+12V : For a microphone that requires +12V AB power supply
OFF : For a dynamic microphone or other type of microphone that does not require power supply
P.+48V : For a microphone that requires +48V phantom power supply



Reference:

Set the GAIN setting for the microphone amplifier by the menu operation.
See “Chapter 5. Setting with menu functions” for the setting menu.

Connecting the Headset

This product can connect an intercom to the two lines (INCOM-1 and INCOM-2). Select the line according to the use (for engineer or for producer, etc). This section explains the use case for INCOM-1.

1 Connect a headset connector to the INCOM-1 connector.

2 Turn on the INCOM-1 switch.

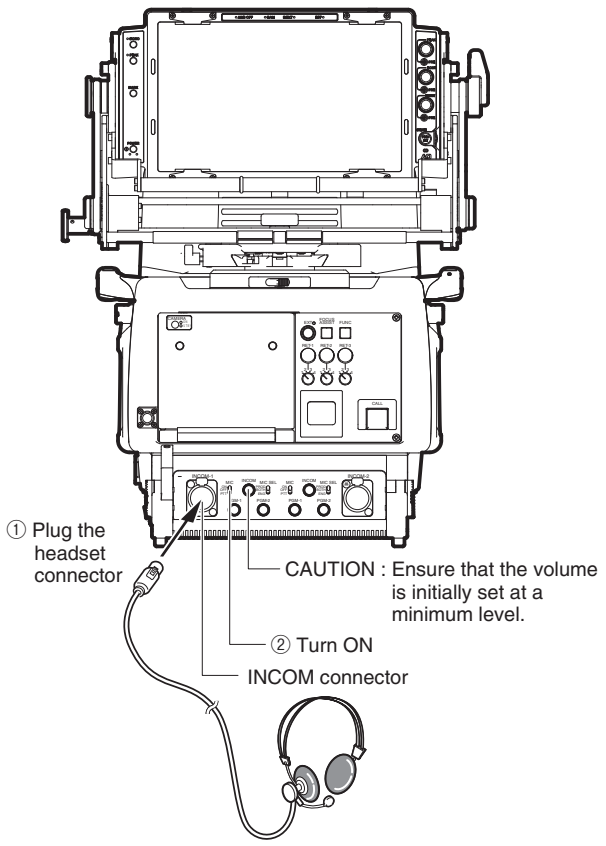
Caution:

Do not set the volume of intercom receiver to near maximum level from the beginning. Using the intercom with loud volume may cause a ruptured or damaged eardrum.

Reference:

Adjust the volume when the sound from the intercom receiver is difficult to hear or too loud. See "5. Camera settings and adjustments [Audio volume adjustment of headsets]" for the audio volume adjustment of intercom.

Camera rear view



3.3 Power Connection

There are two ways to supply power to the camera. Select the power supply according to the system configuration and operating system.

● ***When the power is directly supplied to the camera (self-contained operation)***

Connects the AC cable to the AC IN connector on the left side of camera.

Caution:

Make sure to remove the AC cable from the AC IN connector after the self-contained operation for your safety.

● ***To supply from the CCU***

Connect the camera and the CCU via the fiber cable. The fiber cable contains a power conductor.

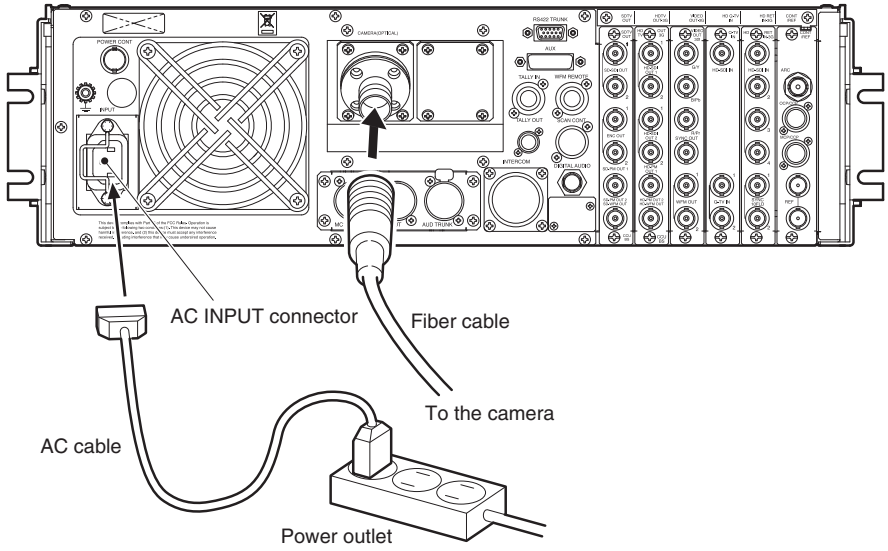
Note:

Make sure the POWER switch of the CCU is set to “OFF” before connecting to the power supply.

Power Supply from CCU

This section explains how to supply power from the CCU-970.

CCU-970 rear view



1 Make sure the CCU-970 MAIN POWER switch is OFF.

2 Connect the AC cable to the AC INPUT connector on the rear of CCU-970.

3 Insert the AC plug into the power outlet.

4 Connect the CCU-970 and the camera via a fiber cable.

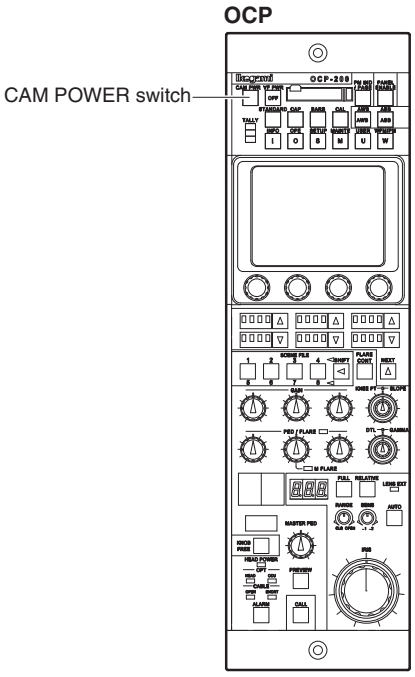
This completes the procedure for connecting power from the CCU-970 to the camera. Proceed to the next step if you want to control the power ON/OFF from the OCP.

■ *To Control Power ON/OFF from OCP (Remote Control)*

You can control the power of the camera using the OCP.

5 Set the CCU MAIN POWER switch on the front of the CCU to “ON”.

6 Set the CAM POWER switch on the OCP to “ON”.



Note:

When the CAM POWER switch on the OCP is turned “ON/OFF”, only power supply to the camera is turned “ON/OFF”, and the CCU power is not turned “ON/OFF”.

3.4 Monitor Connection

This section explains how to connect a monitor to this product and peripherals.

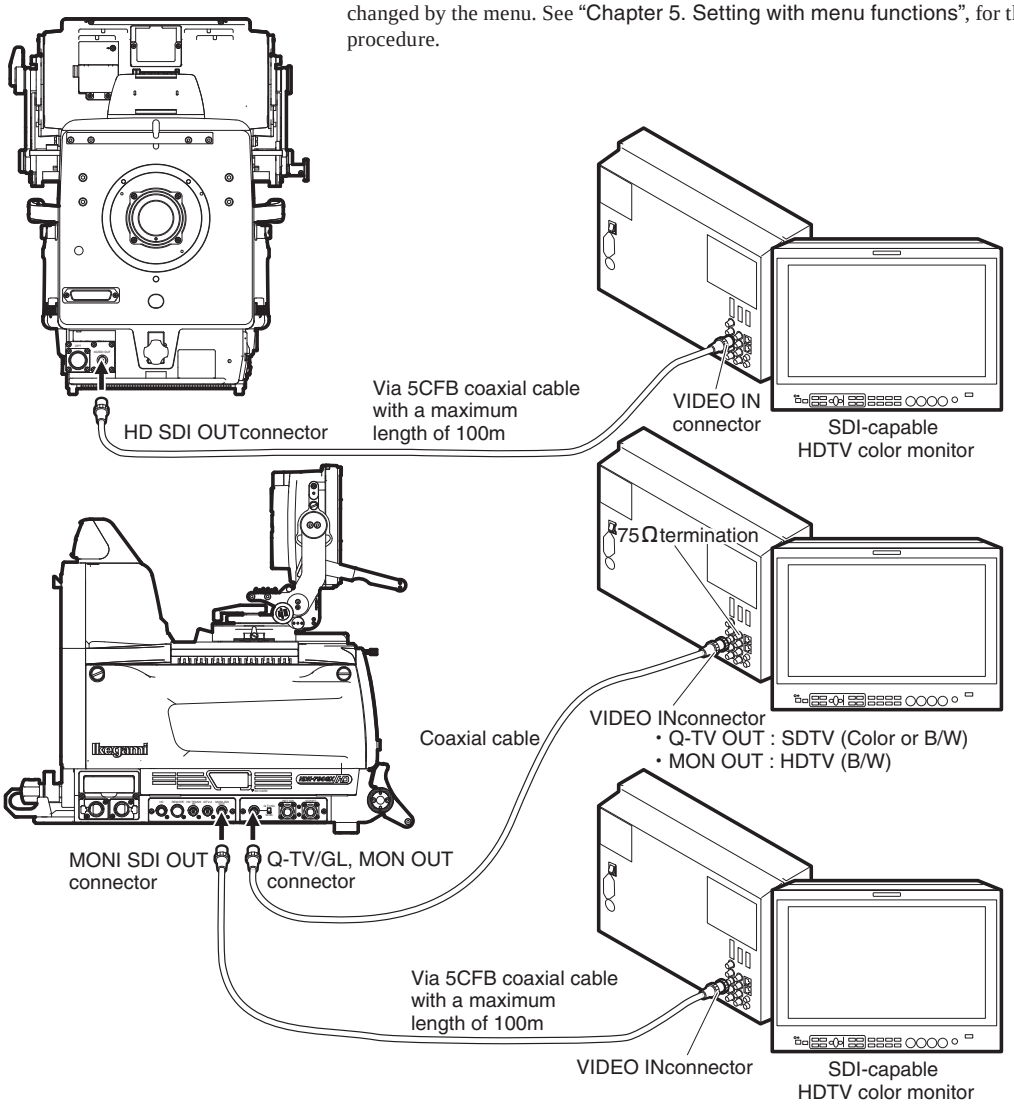
Connecting Camera and Monitor

There are three connectors on the front and side of the camera to output various image signals. Since each image output signal from the connectors is different, connect them with coaxial cables according to your monitor type.

- Q-TV/GL, MON OUT connector : Use Q-TV/GL and MON OUT selector switches to switch between Q-TV/GL and MON OUT outputs.
  When "Q-TV/GL" is selected, it will be the Q-TV OUT for CCU operation and the external sync signal input (genlock input) for a self-contained operation.
  When MON is selected, this becomes the monitor output of the camera images, and the same image signals are output as the viewfinder.
- HD SDI OUT connector : Outputs the digital serial video signal. It supports the HDTV SDI signal.
  (It does not support SDTV SDI signal.)
- MONI SDI OUT connector : Outputs the digital serial video signal. It supports the HDTV SDI signal. (It does not support the SDTV SDI signal)

Reference:

SDI OUT:
The output signals from the HD SDI OUT and MONI SDI OUT connectors can be changed by the menu. See "Chapter 5. Setting with menu functions", for the setting procedure.

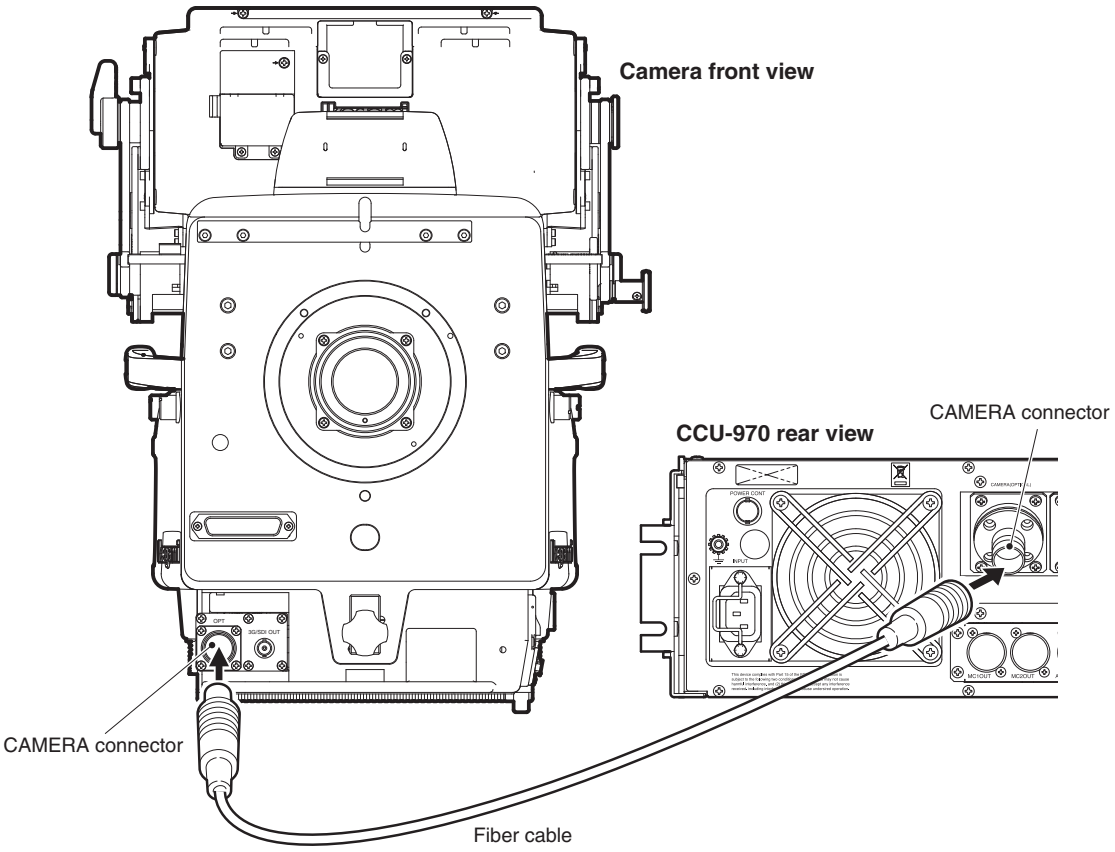


3.5 CCU Connection

This section explains how to connect the HDK-790GX to the CCU. CCU-970 is used here as an example.
Two types of fiber cables are available in different shapes.

- Fiber cable (2-core single mode) : Diameter 9.2mm or 16mm, Maximum length 2000m (when CCU-970 is used)

Connecting Camera and CCU



1 Connect the CAMERA connector on the rear of the CCU-970 to the CAMERA connector on the front of the camera via a fiber cable.

Caution:

- The fiber cable has a male plug connector on one end and a female plug connector on the other end. Be sure to connect the female plug connector to the camera and the male plug connector to the CCU.
- Secure the fiber cable with the CAMERA CABLE clamp on the front side of the camera to remove any slack. See "SAFETY PRECAUTIONS" described at the beginning of this manual for how to secure the cable with the cable clamp and how to handle the fiber cable.

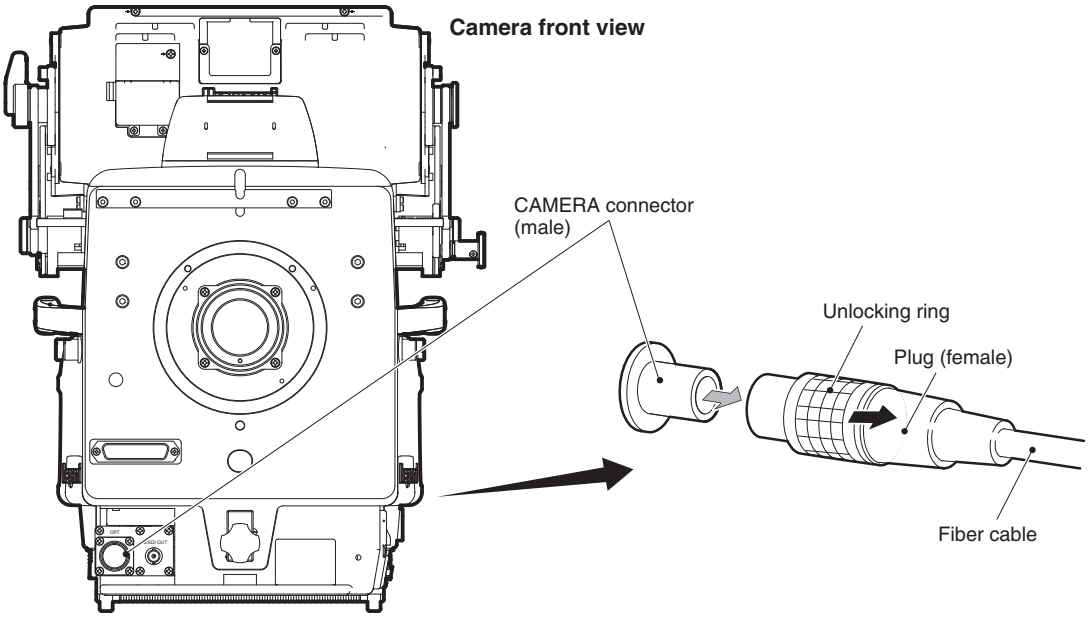
■ *Removing the Fiber Cable*

This section explains how to remove the fiber cable.

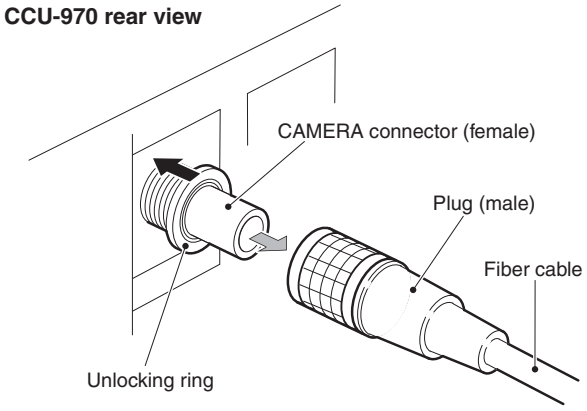
Caution:

When you remove the cable, be sure to hold the plug and pull. Failure to do so may damage the fiber in the cable.

● *Camera*



● *CCU*



1 Remove the cable from the camera while pulling the unlocking ring on the fiber cable plug (female) toward you.

If the connector tip is locked, the fiber cable will not be removed. If it is locked, push the fiber cable toward the CAMERA connector, and then remove as described above.

2 Remove the cable from the CCU-970 while pushing the unlocking ring of the CAMERA connector on the rear of CCU-970.

If the connector tip is locked, the fiber cable will not be removed. If it is locked, push the fiber cable toward the CAMERA connector, and then remove as described above.

4

OPERATION

4.1 Operating Procedures

This chapter explains how to operate the HDK-790GX camera.

Initial Operation Check

When you use the camera for the first time after purchase, ensure that it works properly.

- ◆ 4.2 Switch Position Check
- ◆ 4.3 Turning ON Power
- ◆ 4.5 Output Signal Check
  - Color-Bar Signal Check
  - Test Pulse Check (CAL Signal)
  - Check by Use of External Chart

Preparation Before Shooting

Studio Operation

- ◆ 4.4 Viewfinder Adjustment
  - Diopter Adjustment and Screen Adjustment
  - Display Mode Check
- ◆ 4.5 Output Signal Check
  - Color-Bar Signal Check
  - Test Check (CAL Signal)
  - Check by Use of External Chart
- ◆ 4.6 Auto Setup

<Pattern 1>
1 LEVEL Auto Setup
2 Black Shading

<Pattern 2>
1 Auto Black Balance (ABB)
2 Auto White Balance (AWB)

<Pattern 3>
1 Black Shading
2 Auto White Balance (AWB)

(Execute one of the above patterns.)

Outdoor operation such as sports broadcasting

- ◆Shooting in a Particular Environment
- ◆ 4.4 Viewfinder Adjustment
  - Diopter Adjustment and Screen Adjustment
  - Display Mode Check
- ◆ 4.5 Output Signal Check
  - Color Bar Signal Check
  - Test Check (CAL Signal)
  - Check by Use of External Chart
- ◆ 4.6 Auto Setup

<Pattern 1>
1 QUICK Auto Setup
2 Auto White Balance (AWB)

<Pattern 2>
1 Auto Black Balance (ABB)
2 Auto White Balance (AWB)

<Pattern 3>
1 Black Shading
2 Auto White Balance (AWB)

(Execute one of the above patterns.)

Shooting Settings and Adjustment

Make IRIS and pedestal adjustments and various function settings according to the environment in which the camera is used.

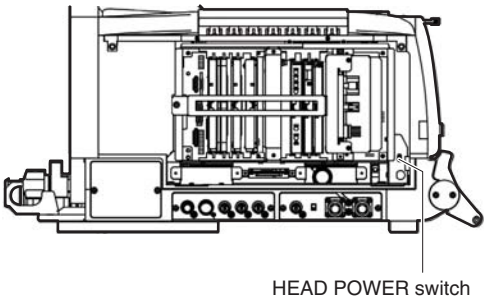
- ◆Camera menu settings
  Refer to "5. CAMERA SETTINGS and ADJUSTMENT"
- ◆ CCU menu settings
  Refer to the operation manual accompanying CCU-970 to be used.

4.2 Switch Position Check

When the camera is used for the first time, set the switches on the camera to the positions indicated in the figures below, and ensure that the camera works properly. Once set, these switches do not have to be set again unless required. This section explains a camera system connected to the CCU.

■ *Camera inside the right side plate*

- HEAD POWER switch : ON



■ *Camera control panel*

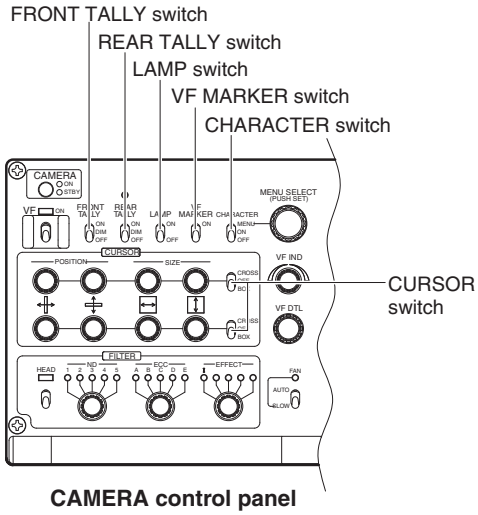
- FRONT TALLY switch : ON
- VF MARKER switch : ON
- CHARACTER switch : ON
- CURSOR switch : OFF
- LAMP switch : ON

Note:

The FILTER local indicator lights up when the CCU is connected, and the camera has an operation right for the CC FILTER switch and ND FILTER switch.
Pressing the FILTER HEAD switch will switch the operational priority between the camera and CCU.

Caution:

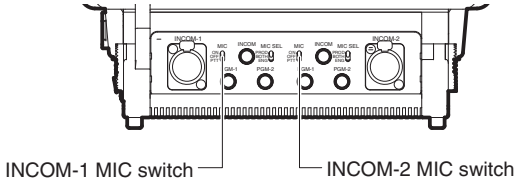
If the REAR TALLY switch is set to OFF, the light does not turn on even when the FOCUS-ASSIST function / FUNC function is turned ON.



CAMERA control panel

■ *Rear view Camera INCOM panel*

- INCOM-1 MIC switch : ON
- INCOM-2 MIC switch : ON

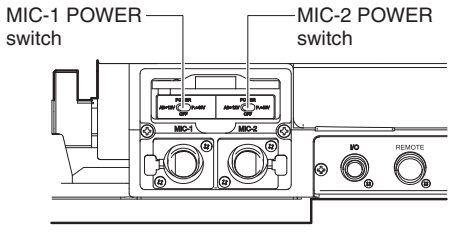


■ *Camera Right View MIC AMP (option)*

- MIC-1 POWER switch
- MIC-2 POWER switch

Depending on the type of microphone to use, the power supply settings differ.

Switch Position	Description
AB+12V	Supplies +12V AB power to the microphone.
OFF	Supplies no power to the microphone. Applicable for a dynamic microphone or a microphone with built-in power supply which requires no power supply.
P.+48V	Supplies +48V Phantom power



Reference:

For details on the microphone, refer to the instructions accompanying the microphone to be used.

4.3 Turning ON Power

The procedure to turn on the power varies depending on the method to supply the power to the camera. This chapter explains the method to directly supply the AC power supply to the camera and the method to supply the power from the CCU.

When the power is supplied from the AC IN connector of camera (self-contained operation)

Confirm the AC power supply voltage before turning ON the camera. Supply of wrong AC voltage can damage the internal transformer or circuit boards.

Reference:

See "3. Installation and connection of camera equipment [Supplying power from AC IN connector (self-contained operation)]" for the method to supply power from the AC IN connector and the method to turn on the camera.

1 Turn "ON" the HEAD POWER switch inside the right side panel of the camera

Power is supplied to the camera, and the POWER indicator of the control panel on the back of camera lights up in green.

Power Supply from CCU

Before turning the camera ON, set the switches to the following positions in normal operations. The power is turned ON/OFF by the MAIN POWER switch on the CCU.

	Switch	Switch Position
Camera	HEAD POWER switch	ON
CCU	CCU MAIN POWER switch	OFF
	HEAD POWER switch	I
OCP (*)	CAM POWER switch	ON

(*) When OCP-200 is used, the setting for the CAM POWER switch is not necessary.

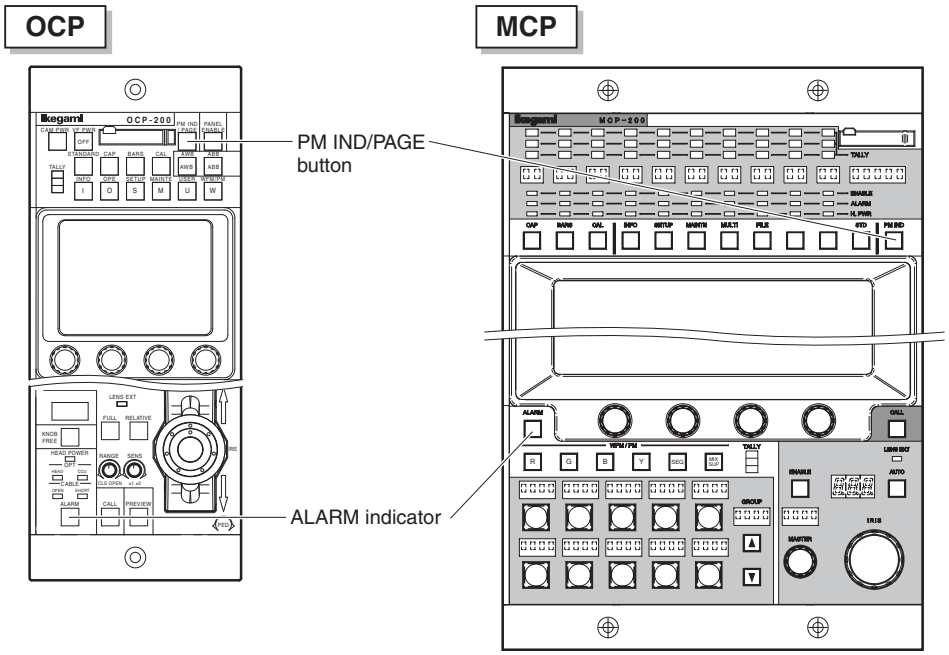
1 Turn ON the MAIN POWER switch on the CCU.

The CCU checks the fiber cable connection and supplies power to the camera if the cable is properly connected. The CABLE indicator on the CCU will indicate the connection status of the fiber cable.

NORMAL (green) : Lights when the fiber cable is normally connected. The CCU checks the camera code transmitted from the camera to confirm that the camera is an applicable model, and then supplies power to the camera.
OPEN (red) : Lights when the fiber cable is not connected or there is an "open" in the fiber cable.
SHORT (red) : Lights when a short circuit occurs in the fiber cable due to a cause such as water.

2 Make sure that the ALARM indicator on the OCP or MCP is not flashing.

When the camera self-diagnosis function detects errors, the ALARM indicator flashes, and the self-diagnosis information will be displayed for 20 seconds.



Note:

You can display the self-diagnosis information and check the status by pressing the PM IND/PAGE button even when the ALARM indicator is not flashing.

■ *To Control Power ON/OFF from OCP*

It is possible to use the OCP to control the camera power source.
When the CAM POWER switch of OCP has been turned ON/OFF, only the camera power supply is turned ON/OFF. The CCU power supply is not turned ON/OFF.

4.4 Viewfinder Adjustment

Caution:

Be careful not to catch your fingers between the VF and the pan tilt adjustment table when adjusting and operating the VF.

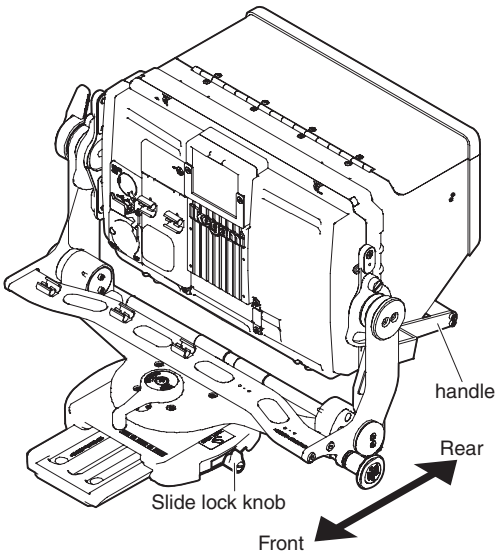
Adjusting the front-rear position of the Viewfinder

This section explains how to adjust the front-rear position of the VF.

1 Rotate the slide lock knob to the left and loosen the break.

2 Adjust the front-rear position of the VF with the handle.

3 Rotate the slide lock knob to the right and apply the break.



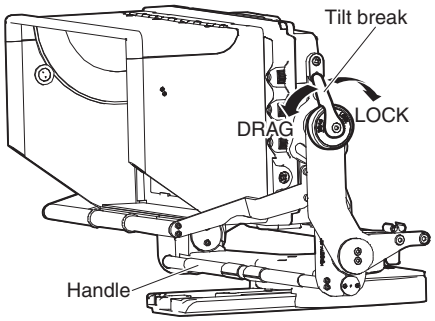
Adjusting the tilt of the Viewfinder

This section explains how to adjust the tilt of the VF.

1 Rotate the tilt break knob to the left and loosen the break.

2 Adjust the tilt of the VF with the handle.

3 Rotate the tilt break knob to the right and apply the break.



Adjusting the Height of the Viewfinder

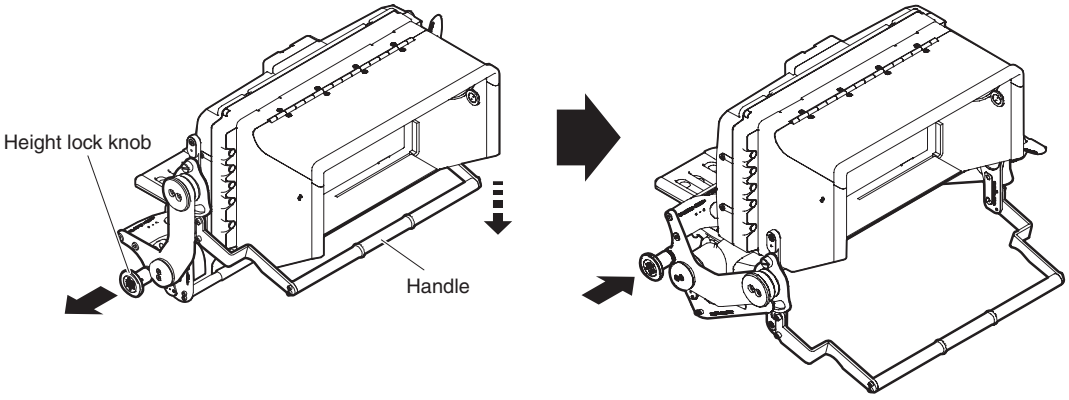
This section explains how to adjust the height of the VF.

1 Pull the height lock knob and unlock the VF.

2 Adjust the height of the VF moving the handle up and down.

Set the height of the VF to an easy-to-operate position.

3 Press the height lock knob and lock the VF.



Adjusting the direction of the Viewfinder

This section explains how to adjust the direction of the VF.

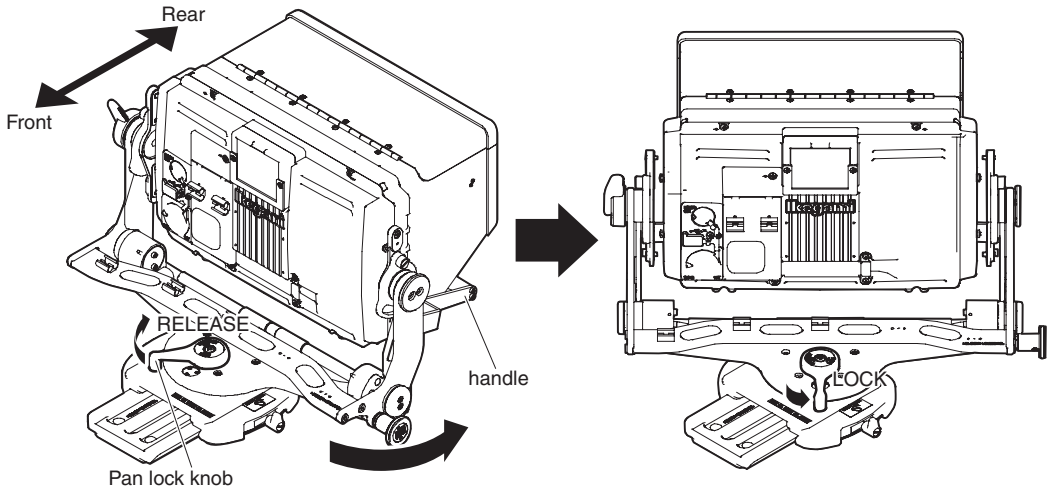
Note:

No panning is possible if the front-rear position of the camera is set at the front. Panning is possible only when the camera is placed at the rear position.

1 Rotate the pan lock knob to the RELEASE side and loosen the break.

2 Adjust the direction of the VF with the handle.

3 Rotate the pan lock knob to the LOCK side and apply the break.



4.5 Output Signal Check

After turning ON the power, ensure that signals are correctly output on the PM and WFM. If the signals are not output for some reason, check the following before concluding that there is a failure.

- Are the cables properly connected ?
- Are the switches correctly set ?
- Is the breaker thrown ?
- Is the POWER switch set to ON ?

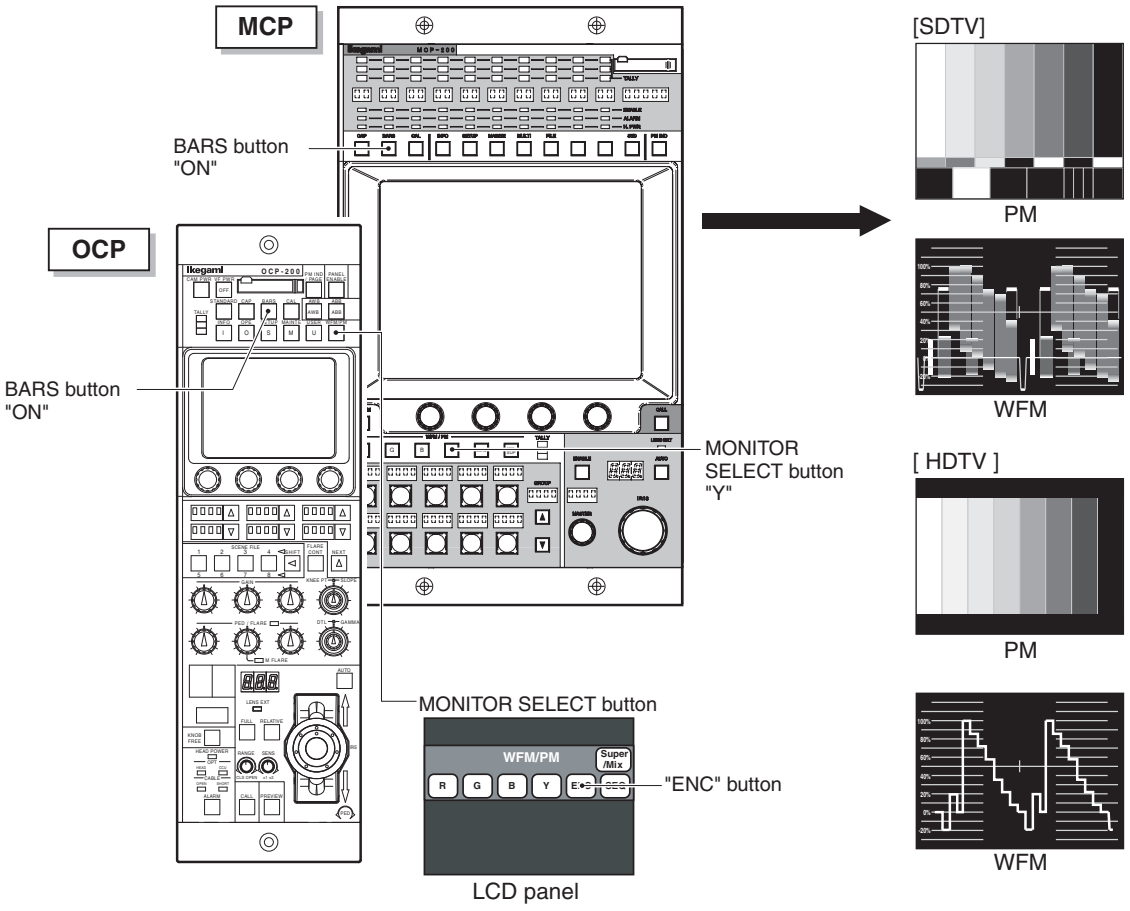
Reference:

See “3. INSTALLATION and CONNECTION” for connection of peripheral equipment.

Color-Bar Signal Check

1 Set the BARS button on the OCP or MCP to ON.

Ensure that a normal color-bar signal is output.
To output color-bar signals to the monitor system, operate the MONITOR SELECT button.



Note:

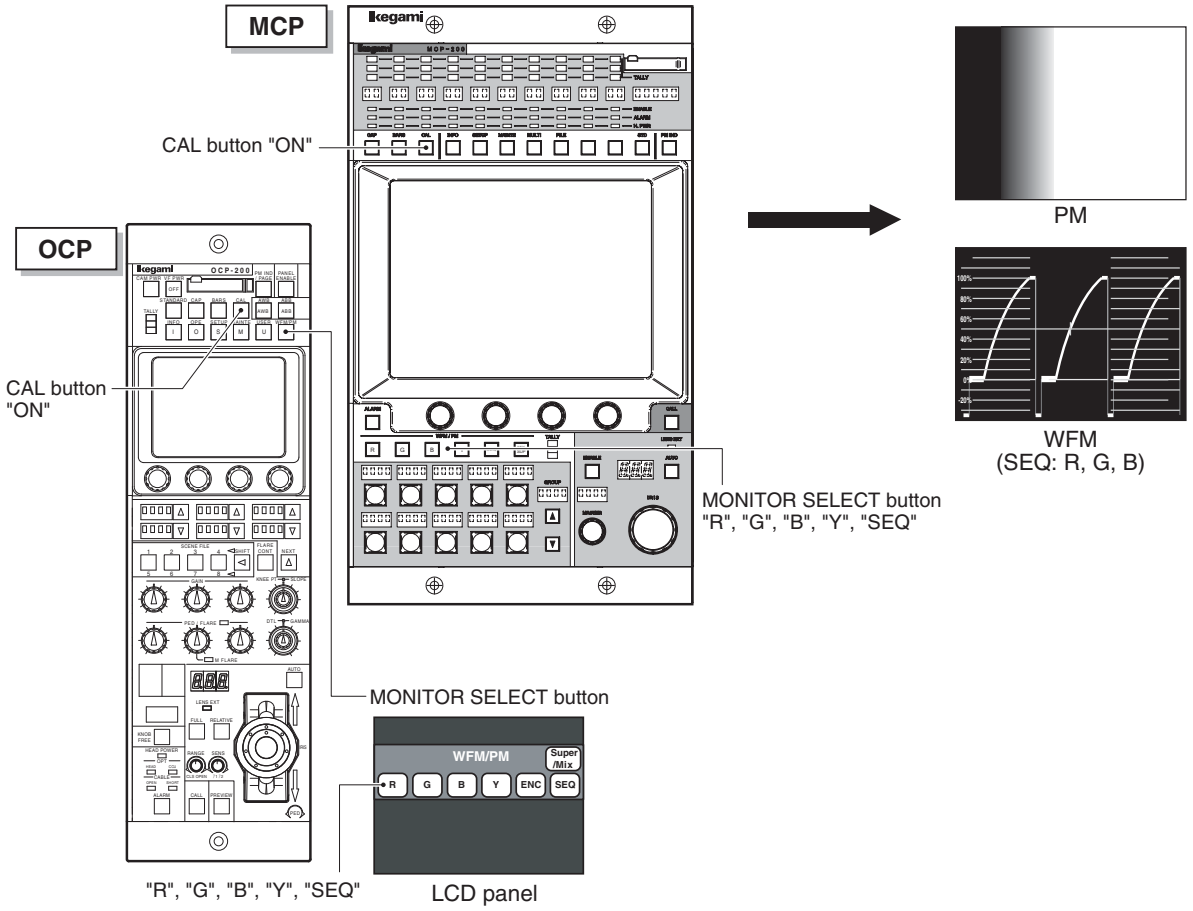
When no color bar signal is not displayed on the SDTV signal while you use MCP-200 and press the “Y” button of the MONITOR SELECT buttons, refer to the operation manual for MCP-200.

Test Pulse (CAL Signal) Check

Check if the level of the video system is normal.

1 Set the CAL button on the OCP or MCP to ON.

Ensure that 100% level of test pulse is output.



External Chart Check

Shoot an external chart and ensure that the image is normal.

4.6 Auto Setup

The camera is equipped with an auto setup function that automatically adjusts various levels and settings using the CPU of the camera.

● *FULL auto setup*

Executes all auto setup items in the camera. This is mainly executed after maintenance and inspection.

● *LEVEL auto setup*

Set the video processing levels. This process can be executed daily before using the camera.

● *FULL QUICK auto setup or QUICK auto setup*

Because the FULL QUICK and QUICK auto setup use an electrical test pulse signal built in the camera, you do not need an external chart. Setup is possible even when you cannot shoot a chart.
Because the QUICK auto setup uses a test pulse, the setup does not include adjustment of some circuits, CCDs, lens, etc. which are in the path prior to the point of injection of the test signal.

● *Auto White Balance (AWB)*

Sets the white level of the R and B signals. White balance needs to be readjusted when the color temperature of the light source changes or optical filters are changed because white balance is affected by the color temperature of the light source and by optical filters.

● *Auto Black Balance (ABB)*

Sets the black level of the R, G and B signals. Though black balance is affected neither by the color temperature of the light source nor by optical filters, it needs to be readjusted when GAIN is changed or the ambient temperature has changed significantly.

Note:

Auto setup adjusts the camera based on a reference file. This reference file is created in the memory prior to shipment. The reference file needs to be created again if you want to change the reference for auto setup of the camera.

Auto setup can be activated from the camera, OCP, and MCP. See the table in the next page for which device can activate which auto setup function.

Reference:

For how to execute auto setup from the OCP/MCP, refer to the relevant operation manual.

■ *Auto Setup Function List*

Control Item	Auto Setup Function																	
	OCP						MCP						Camera					
	FULL*2	LEVEL	FULL QUICK*2	QUICK	AWB	ABB	FULL	LEVEL	FULL QUICK	QUICK	AWB	ABB	FULL	LEVEL	FULL QUICK	QUICK	AWB	ABB
REF	INT/EXT	EXT	INT/EXT	EXT	EXT	EXT	INT/EXT	EXT	INT/EXT	EXT	EXT	EXT	INT/EXT	EXT	INT/EXT	EXT	EXT	EXT
LEVEL																		
BLK SET	R, G, B	R, G, B	R, G, B	R, G, B		R, G, B	R, G, B	R, G, B	R, G, B	R, G, B		R, G, B	R, G, B	R, G, B	R, G, B	R, G, B		R, G, B
PED	R, G, B	R, G, B	R, G, B	R, G, B		R, G, B	R, G, B	R, G, B	R, G, B	R, G, B		R, G, B	R, G, B	R, G, B	R, G, B	R, G, B		R, G, B
GAIN	R, Ⓖ B	R, Ⓖ B	R, G, B	R, G, B	R, B		R, Ⓖ B	R, Ⓖ B	R, G, B	R, G, B	R, B		R, Ⓖ B	R, Ⓖ B	R, G, B	R, G, B	R, B	
GAMMA	R, G, B	R, G, B	R, G, B	R, G, B			R, G, B	R, G, B	R, G, B	R, G, B			R, G, B	R, G, B	R, G, B	R, G, B		
FLARE	R, G, B	R, G, B	R, G, B	R, G, B			R, G, B	R, G, B	R, G, B	R, G, B			R, G, B	R, G, B	R, G, B	R, G, B		
WHITE CLIP	R, G, B	R, G, B	R, G, B	R, G, B			R, G, B	R, G, B	R, G, B	R, G, B			R, G, B	R, G, B	R, G, B	R, G, B		
AUTO KNEE																		
SLOPE	R, G, B	R, G, B	R, G, B	R, G, B			R, G, B	R, G, B	R, G, B	R, G, B			R, G, B	R, G, B	R, G, B	R, G, B		
POINT	R, G, B	R, G, B	R, G, B	R, G, B			R, G, B	R, G, B	R, G, B	R, G, B			R, G, B	R, G, B	R, G, B	R, G, B		
MANU KNEE																		
SLOPE	R, G, B	R, G, B	R, G, B	R, G, B			R, G, B	R, G, B	R, G, B	R, G, B			R, G, B	R, G, B	R, G, B	R, G, B		
POINT	R, G, B	R, G, B	R, G, B	R, G, B			R, G, B	R, G, B	R, G, B	R, G, B			R, G, B	R, G, B	R, G, B	R, G, B		
WHITE SHADE																		
H SAW	R, Ⓖ B						R, Ⓖ B						R, Ⓖ B					
H PARA	R, Ⓖ B						R, Ⓖ B						R, Ⓖ B					
V SAW	R, Ⓖ B						R, Ⓖ B						R, Ⓖ B					
V PARA	R, Ⓖ B						R, Ⓖ B						R, Ⓖ B					
BLACK SHADE						*1						*1						*3
H SAW	R, G, B		R, G, B			(R, G, B)	R, G, B		R, G, B			(R, G, B)	R, G, B		R, G, B			(R, G, B)
H PARA	R, G, B		R, G, B			R, G, B	R, G, B		R, G, B			R, G, B	R, G, B		R, G, B			R, G, B
V SAW	R, G, B		R, G, B			R, G, B	R, G, B		R, G, B			R, G, B	R, G, B		R, G, B			R, G, B
V PARA	R, G, B		R, G, B			(R, G, B)	R, G, B		R, G, B			(R, G, B)	R, G, B		R, G, B			(R, G, B)
CAL × 100 (GAIN, PED)	R, G, B		R, G, B				R, G, B		R, G, B				R, G, B		R, G, B			

*1: Executed only when the QUICK button on the MCP is used, or when executing ABS(Auto Black Shading).
*2: FULL Auto Setup and FULL QUICK Auto Setup of OCP are available with OCP-200 only.
*3: Auto adjustment of black shading is also available together with ABB.
See "Auto black shading" for operating procedure.

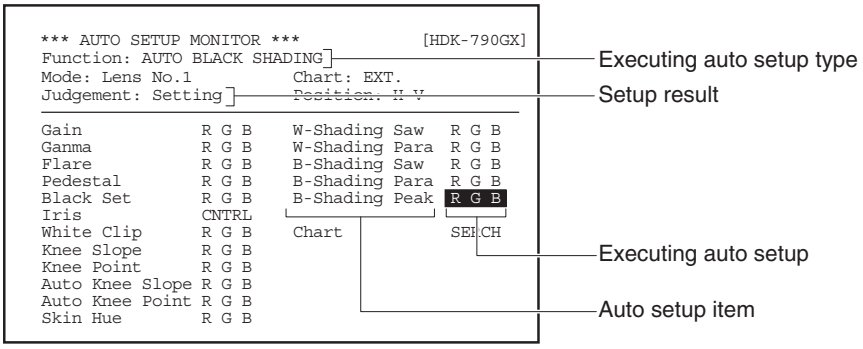
Note:

- INT (internal reference) of REF is the factory setting value by software.
- EXT (external reference) of REF is the value set by the reference set function.
- The item for G channel with a circle only works when it is set with a diascope (lens option). When you use the external chart, set G channel to 100% level by IRIS.

■ *Auto Setup Screen*

When various auto setup functions execute, the execution status is displayed in the viewfinder or on the PM. A currently executing item is indicated by the cursor.
When auto setup successfully completes, “OK” appears beside “Judgement". When it fails, “NG” appears beside “Judgement” with the cursor on the failed item.

[Auto Setup Monitor Execution Display Screen]



FULL Auto Setup and LEVEL Auto Setup

The FULL auto setup and LEVEL auto setup can be activated from the camera menu, OCP, or MCP. This section explains how to activate from the camera menu.

1 Shoot an external auto setup chart.

Make sure that the chart is aligned with the camera horizontally and vertically. Also, be sure to provide even light on the whole chart.

2 Use the CC FILTER switch and ND FILTER switch on the right side of the camera to set the optical filter which suits the light source.

If the operational priority for the filter is not given to the camera, press the FILTER HEAD switch to switch the operational priority to the camera. When the priority is given to the camera, an asterisk (*) is displayed in the viewfinder.

3 Select and activate “FULL” or “LEVEL” from the camera menu “AUTO SETUP MODE” - “AUTO SETUP”.

Note:

To perform the FULL/LEVEL auto setup from an OCP or MCP, perform the following steps.
1. Press the SETUP button in the function switch part.
2. Press the AUTO SETUP button on the LCD.
3. Press the Full or Level button on the LCD.
4. Press the Start button on the LCD.

FULL QUICK Auto Setup and QUICK Auto Setup

To activate the FULL QUICK auto setup or QUICK auto setup from the camera, select “F.QUICK” or “QUICK” from the camera menu “AUTO SETUP MODE” - “AUTO SETUP". To perform the FULL QUICK/QUICK auto setup from an OCP or MCP, perform the following steps.

1 Press the SETUP button in the function switch part.

2 Press the AUTO SETUP button on the LCD.

3 Press the Full Quick or Quick button on the LCD.

4 Press the Start button on the LCD.

Auto White Balance

The auto white balance is performed from the OCP or MCP. It cannot be performed from the camera.

1 Shoot the subject which contains white color.

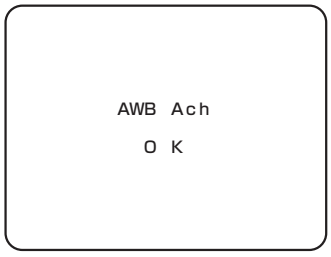
Select the subject in which 10% or more of the screen area is occupied with white color when shooting.

2 Press the “AWB” button on the OCP or MCP.

The auto white balance will be performed.

3 Check the results.

“OK” or “NG” will be displayed on the viewfinder screen when completing the auto white balance.
When “NG” is displayed, check if the subject satisfies the above requirements and the optical filter is correct. Then, repeat the procedure from step 1.

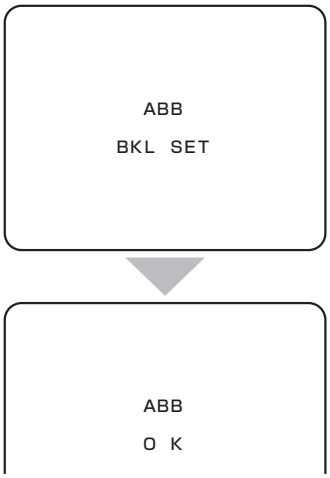


Caution:

Make sure that the R and B GAIN control knob of OCP or MCP is in the center position before performing the auto white balance. If the control knob is not in the center position, the control range will be biased to one side.

Auto Black Balance

Perform the auto black balance from OCP or MCP. You cannot perform from the camera.



1 Press the “ABB” button on the OCP or MCP.

The status is automatically changed to the CAP status and then the auto black balance will be performed.

2 Check the results.

When the auto black balance is completed, "OK" or "NG" will be displayed on the viewfinder screen.

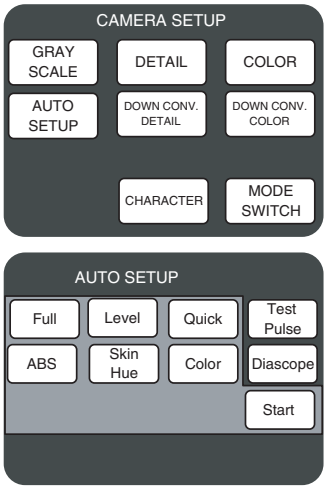
Caution:

Be sure to set the R/G/B FLARE and MASTER PEDESTAL control knobs on the OCP to the center position before activating the auto black balance from the camera. If the control knobs are not at the center position, the control range will be biased to one side.

Auto Black Shading

Perform the auto black shading from OCP or MCP. You cannot perform from the camera. This section explains how to perform it from OCP-200.

LCD panel



1 Press the "SET UP" button on the OCP-200.

The "CAMERA SETUP" menu will be displayed in the LCD panel.

2 Press the "AUTO SETUP" button.

The "AUTO SETUP" menu will be displayed in the LCD panel.

3 After pressing the "ABS” button, press the "Start" button.

The auto black shading will be performed.

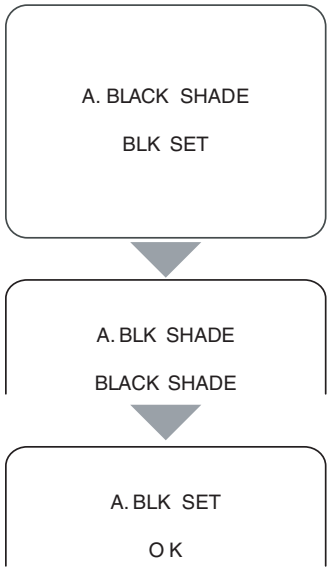
4 Check the results.

When the auto black shading is completed, "OK" or "NG" will be displayed on the viewfinder screen.

Note:

- When the result of the auto black balance is "NG", the auto black shading will be stopped.
- When you want to stop the auto black shading, press the "Start" switch again before the result is displayed. The setting that has been corrected up to that point will be cleared, and returns to the state it was before performing the auto black shading.

Viewfinder screen



4.7 Preparation for Shooting in Particular Environment

When the camera is used in a particular environment such as where the temperature is extremely low, where the camera is subject to direct sunlight throughout the day, or where the electromagnetic field is so strong that the electronic circuits malfunction, it is necessary to take the following protective measures for proper operation of the camera.

■ *Shooting in an extremely cold location*

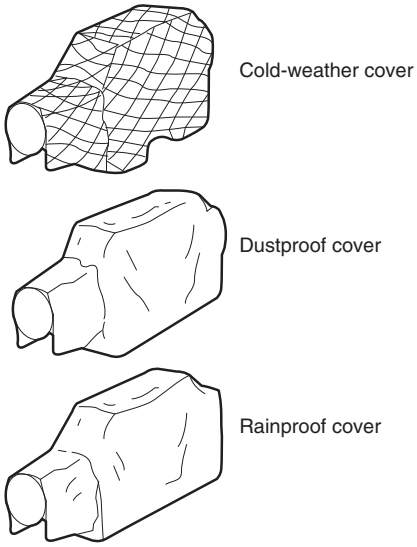
Change the oil with that for cold districts in advance. Otherwise the oil freezes because of the extremely low temperature and the movement of the tripod, focus, zoom, and iris will become heavy. Put a cold-weather cover on the camera, and fully warm up the camera before using it.

■ *Shooting in a dusty place or in the rain*

The camera is dustproof and rainproof design. However, when shooting in a dusty place or in the rain, put a dustproof cover or a rainproof cover on the camera.

■ *Shooting where the electromagnetic field is strong*

When shooting where the electromagnetic field is excessively strong, such as in airports, military bases or transmitting stations, completely shield the camera by thoroughly covering it with aluminum foil.
It is necessary to take the same measure for other devices.



CAMERA SETTINGS and ADJUSTMENT

5

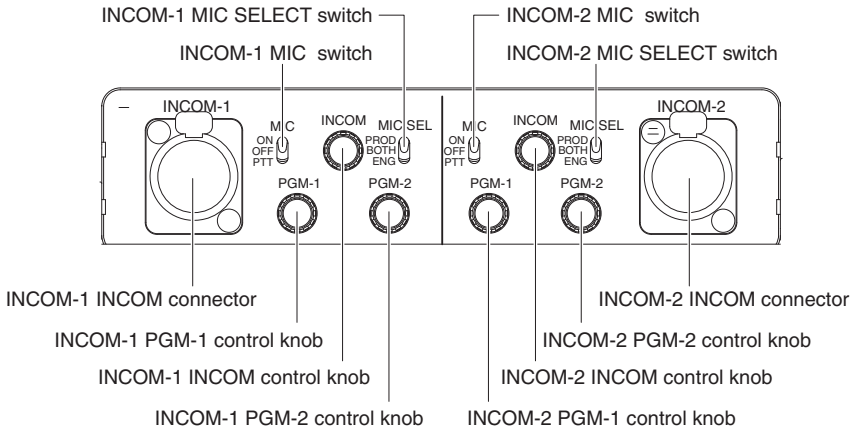
5.1 Settings Using Switches on the Camera

Adjusting Headset Volume

This chapter explains how to control the headset volume.

Caution:

Do not set the INCOM-1 control knob, INCOM-2 control knob, INCOM-1 PGM-1/2 control knob, and INCOM-2 PGM-1/2 control knob to near maximum level from the beginning. Setting the volume level too high with the intercom headset on your ears may damage your eardrums. If you suddenly set the volume level too high, it may also damage the headset. Excessive sound pressure from the headset may cause a hearing loss.



■ *Adjusting Intercom Volume*

The intercom receiver can be adjusted on the rear side of the camera.

1 Turn the INCOM-1 control knob and INCOM-2 control knob on the rear of the camera to adjust the volume.

Caution:

Be sure to adjust the volume to the appropriate level while listening to sound through the headset.

■ *Adjusting Intercom PGM Volume*

The intercom PGM volume can be controlled on the rear side of the camera.

1 Turn the INCOM-1 PGM-1/2 control knob and INCOM-2 PGM-1/2 control knob on the rear of the camera to adjust the volume.

Caution:

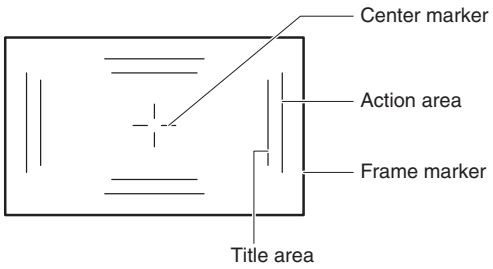
Be sure to adjust the volume to the appropriate level while listening to sound through the headset.

Marker display in the viewfinder

Various markers can be displayed in the viewfinder.

■ *Center marker, Safety marker, Frame marker*

- Center marker : Used to find the center of the screen or adjust the horizontal and vertical positions of camera.
- Safety marker : Used to find the action safety zone or title safety zone. You can be switching the Action area or the Title area by the menu setting.
- Frame marker : Used to ascertain the picture frame of the image taken.



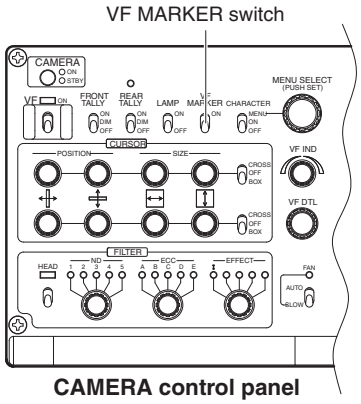
1 Press the VF MARKER switch on the camera control panel toward the "ON" side.

Note:

You can set the aspect ratios of the safety marker and frame marker (4:3/13:9/14:9/16:9).

Reference:

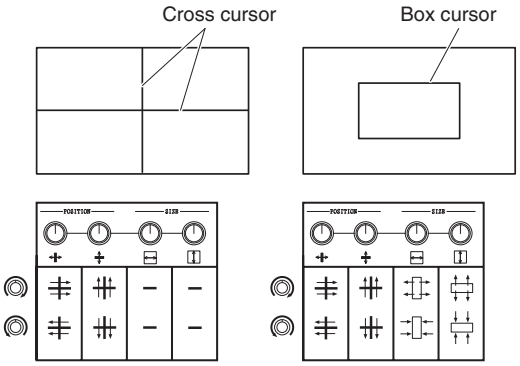
See “5. Camera settings and adjustments [VF DISPLAY]” for the display settings of each marker.



CAMERA control panel

■ *Cross cursor, Box cursor*

- Cross cursor : Used to adjust the horizontal and vertical positions of camera and position the subject.
- Box cursor : Used as a guideline for determining the composition of the subject or trimming the screen.



1 Set the CROSS/BOX selector switch on the camera control panel toward the "CROSS" or "BOX" side.

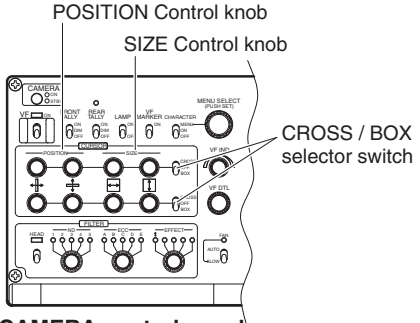
A cross cursor or box cursor will be displayed on the viewfinder.

CROSS/BOX selector switch
- CROSS : Displays a cross cursor.
- OFF : Does not display a cursor.
- BOX : Displays a box cursor.

2 Turn the POSITION control knob and SIZE control knob to adjust it to the appropriate position and size.

Note:

Since this product is equipped with two each of CROSS/BOX selector switches, POSITION control knobs, and SIZE control knobs, there are the following three ways to display.
- Displays two cross cursors.
- Displays two box cursors.
- Displays one cross cursor and one box cursor.



CAMERA control panel

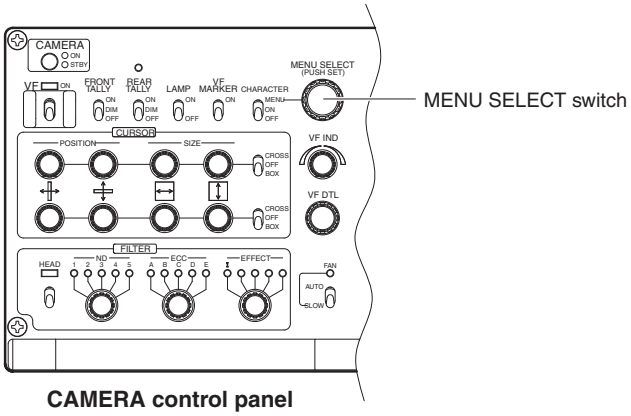
Setting the digital extender

You can set ON/OFF for the digital extender function and the magnification from the switch on the camera, the camera menu, or a remote controller (OCP, MCP, etc.).

Reference:

See “5.2 Settings from the Menu [Menu Configuration and content]” in this chapter for setting the digital extender from the camera menu.

Refer to the instruction manual for the respective remote controller for setting the EFFECT filter from a remote controller.



CAMERA control panel

1 Keep pressing the MENU SELECT switch on the camera control panel, without the camera menu displayed, until the character of the digital extender flashes.

2 While the character of digital extender is flashing, turn the MENU SELECT switch to any magnification, and press the MENU SELECT switch.

Note:

Flashing stops automatically about 3 seconds after the setting procedure is completed.

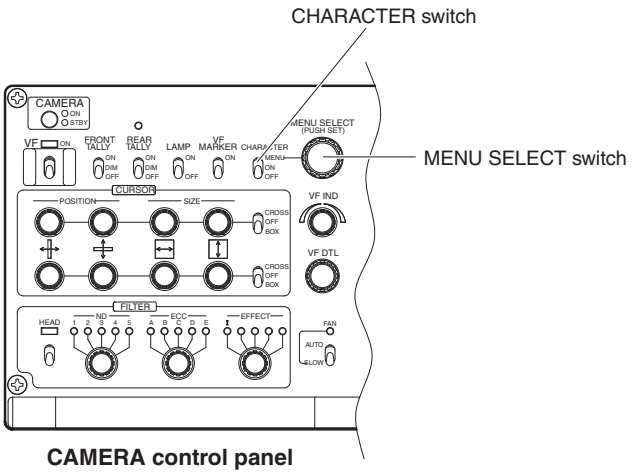
Reference:

You can restrict the setting of ON/OFF and magnification of the digital extender from the MENU SELECT switch. See “5.2 Settings from the Menu [Menu Configuration and content]” in this chapter.

5.2 Settings from the Menu

Basic Operation of the Menu

The menu function can set up the items to display in the viewfinder and other various status of the camera to suit the shooting conditions. The selection and setting of each item are performed by displaying the main menu/submenu in the viewfinder or the monitor.



CAMERA control panel

CHARACTER switch : Displays the menu screen.
MENU SELECT switch : Used to select and confirm the setting items in the menu and other various settings.
-Turn the switch to “Select”
-Press the switch to “Confirm”

■ *Displaying the Simple Menu*

This section explains how to display the simple menu in the viewfinder and monitor.

1 Press the CHARACTER switch toward the “MENU” side.

The settings of the simple menu will be displayed on the VF and monitor.

```
*** MENU ***
▸VF DISPLAY
 VF DTL
 VF MODE
 FOCUS ASSIST
 MIC GAIN CONTROL
 RETURN SELECT MODE
 FILTER SERVO MODE
 SW FUNCTION
 INFORMATION
```

■ *Displaying the Main Menu*

This section explains how to display the main menu in the viewfinder and monitor.

1 Press the CHARACTER switch toward the “MENU” side while pressing the MENU SELECT switch.

The main menu screen will be displayed on the VF and monitor.

```
*** MENU (1/4) ***
▸VF DISPLAY
 VF DTL
 VF MODE
 FOCUS ASSIST
 MIC GAIN CONTROL
 RETURN SELECT MODE
 FILTER SERVO MODE
 SW FUNCTION
 INFORMATION
```

Shift to a menu (4/4).

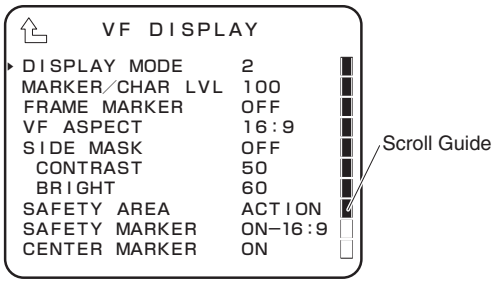
Main Menu

Shift to a menu (2/4).

■ *Displaying the Submenu*

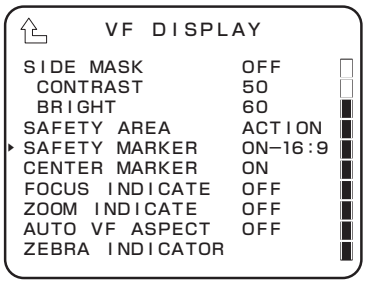
You can perform various settings on the submenu that is displayed from the main menu in the viewfinder or monitor.

1 Make sure that the main menu is displayed.



2 Turn the MENU SELECT switch to move the flashing cursor to the setting item, and then press the MENU SELECT switch.

The sub menu will be displayed, and various settings can be adjusted.



Caution:

If you do not press the MENU SELECT switch after changing the mode setting, the change may be effective.

Note:

- Select "⏎" and press the MENU SELECT switch to return to the main menu.
- The scroll guide is displayed on the submenu containing multiple items.

■ *Exiting the Menu*

This section explains how to exit the main menu/submenu in the viewfinder or monitor.

1 Press the CHARACTER switch toward the "MENU" side again. Or press it toward the "OFF" side.

Exit the main menu screen/sub menu screen.

Menu Configuration and content

The following lists the camera menu configuration.

■ *MENU (Simple Menu)*

The simple menu is the same as MENU (1/4) described below. Refer to items in MENU (1/4) for details of each menu.

■ *MENU (1/4)*

*1

Menu Item	Initial setting	Setting value	Description, Remarks	MENU DATA	
				ALL	VF
VF DISPLAY					
VF ASPECT	16:9	16:9, 4:3	Sets the VF aspect ratio.	✓	✓
SIDE MASK	OFF	ON-14:9, ON-13:9, ON-4:3, OFF	Sets the side mask.	✓	✓
CONTRAST	50	0 to 100	Adjusts the side mask contrast level.	✓	✓
BRIGHT	60	0 to 100	Adjusts the side mask brightness level.	✓	✓
SAFETY AREA	ACTION	ACTION, TITLE	ACTION : Area marker of 93% of the screen height and width. TITLE : Area marker of 89% of the screen height and width.	✓	✓
SAFETY MARKER	ON-16:9	ON-4:3, ON-16:9, OFF	Sets the safety marker.	✓	✓
CENTER MARKER	ON	OFF TYPE1, TYPE2, TYPE3	Sets the center marker.	✓	✓
FRAME MARKER	OFF	ON-16:9, ON-14:9, ON-13:9, ON-4:3, OFF	Sets the frame marker.	✓	✓
FOCUS INDICATE	ON	OFF, ON	Only active when using the serial lens.	✓	✓
ZOOM INDICATE	ON	OFF, ON	Only active when using the serial lens.	✓	✓
VF DTL			Adjusts the overlap amount of the VF image focusing edge signal (VF DTL).	✓	✓
BOOST FREQ	10MHz	10MHz, 15MHz, 18MHz, 18MHzWIDE	Selects the frequency to be boosted.	✓	✓
NOISE SUP	5	0 to 10	Sets the removal level of the noise signal.	✓	✓
VF MODE					
COLOR VF MODE	AUTO	AUTO	AUTO : Automatically recognizes the color VF to convert the VF VIDEO signal to R/G/B output.	✓	✓
VF VIDEO SELECT	Y *2 (R/G/B)	Y, R, G, B, R+G+B, (R/G/B)	Sets the VF image output. R/G/B can be set in case the color VF is mounted or when the COLOR VF MODE is ON.	✓	✓
FRONT TALLY	ENABLE	ENABLE, DISABLE	Sets active/inactive for VF FRONT TALLY.	✓	✓
FOCUS ASSIST					
ASSIST AREA	TRIGGER ON	TRIGGER ON, ALWAYS ON, OFF	Sets the ASSIST AREA display. Select TRIGGER ON if you wish to display with the trigger of lens operation, etc.	-	-
TRIGGER	FOCUS	FOCUS, FOCUS/ZOOM	Trigger to display ASSIST AREA. This setting is used when TRIGGER ON is selected.	-	-
VF DOT BY DOT	UNLINK	UNLINK, LINK	Sets whether a control signal is sent to a VF having a DOT BY DOT display function.	-	-
FOR RET	ON	ON, OFF	Sets whether to display the ASSIST AREA or not when switching to the RET signal.	-	-
ASSIST DATA	NO.1	N0.1 to N0.4	Selects the ASSIST DATA compiled in the ASSIST DATA SETTING menu.	-	-
ASSIST DATA SETTING					
AREA DISP TIME	1.0S	0.0S to 5.0S (units of 0.5 sec)	Sets the time from trigger detection until the focus assist area is erased.	✓	✓
AREA SIZE	15	1 to 100	Sets the focus assist area range. If set to “100", it is the entire screen domain.	✓	✓
AREA LEVEL	60%	100% to 25%	Sets the image level of the ASSIST AREA.	✓	✓
AREA COLOR	MONO	MONO, COLOR, NEGA	Sets whether the ASSIST AREA image should be color, monochrome or negative.	✓	✓
AREA MARKER	OFF	ON, OFF	Sets whether the assist area frame marker is displayed nor not.	✓	✓
EDGE BOOST LEVEL	55	1 to 100	Sets the boost level of the edge signal.	✓	✓
EDGE COLOR	MONO	MONO, CYAN, MAGENTA, YELLOW, GREEN, RED, BLUE	Sets the color of the edge signal.	✓	✓
STORE DATA	---	N0.1 to N0.4	The contents set in the ASSIST DATA SETTING menu are stored as ASSIST DATA. Select the numbers you wish to store from No. 1 to No. 4 and write over the present data to store them.	-	-

Menu Item	Initial setting	Setting value	Description, Remarks	MENU DATA	
				ALL	VF
MIC GAIN CONTROL					
MIC1 STEP	-40dB	+4dB, 0dB, -10dB, -20dB, -30dB, -40dB, -50dB, -60dB	The MIC1 gain is changed step by step.	✓	-
MIC1 FINE	0	-100 to 100	Fine adjustment of the MIC1 gain. The gain decreases about -8 dB with -100, and increases about +8 dB with +100.	✓	-
MIC2 STEP	-40dB	+4dB, 0dB, -10dB, -20dB, -30dB, -40dB, -50dB, -60dB	The MIC2 gain is changed stepwise.	✓	-
MIC2 FINE	0	-100 to 100	Fine adjustment of the MIC2 gain. The gain decreases about -8 dB with -100, and increases about +8 dB with +100.	✓	-
RETURN SELECT MODE					
RET PRIORITY	NOTHING	NOTHING, RET-3, RET-2, RET-1	If a RET image is not displayed in the viewfinder, sets the output signal to MON SDI (during RETURN setting). NOTHING : Sets to RET image last displayed in VF. RET1 : Sets to RET-1 image. RET2 : Sets to RET-2 image. RET3 : Sets to RET-3 image.	✓	-
FILTER SERVO MODE					
SERVO CONT	SERVO	SERVO, MANUAL	SERVO : Sets to automatic control. MANUAL : Sets to manual control.	✓	-
SW FUNCTION					
FUNC SW	VF SEL	VF SEL, SIDE MASK, D.EXT, DOT BY DOT, NONE	Sets the function of the FUNC switch on the rear side. VF SEL : Switches between the signal that is set in the VF VIDEOSELECT menu and the color signal. SIDE MASK : Turns ON/OFF the SIDE MASK display. D.EXT : Turns ON/OFF the digital extender. DOT BY DOT : Turns ON/OFF the DOT BY DOT function on the VF with DOT BY DOT display function.	✓	-
INFORMATION					
MPU MODULE SW	---	MPU substrate DIP SW	Displays the DIP switch settings of the MPU module.	-	-
WORKING TIME	---	*****H (information display)	Displays the total accumulated operation time of the camera up to the present.	-	-
SUB TIME	---	*****H(information display), RESET	Displays the camera's calculated operation time. Differs from WORKING TIME because it can be reset by the user.	-	-
VERSION	---	STR****V**.**.** (information display)	Number to control the structure of the camera software and FPGA. (Regarding the SDI-TRX, because it is on the FA side, it is not included in this control number).	-	-
MPU ROM	---	(information display)	Displays the camera software version.	-	-
D.PROC(PRE)	---	(information display)	Displays the FPGA version.	-	-
D.PROC(POST)	---				
OPT-PULSE	---				
DRIVE&PULSE	---				
MPU	---				
SDI-TRX	---				

*1 : It is possible to determine when loading MENU DATA from the SD CARD whether to read the entire MENU or to read only items related to VF.
The setting of an item having a checkmark is read.

*2 : If the color VF is recognized automatically, the display switches to R/G/B.

■ *MENU (2/4)*

Menu Item	Initial setting	Setting value	Description, Remarks	MENU DATA ALL	MENU DATA VF
VIDEO OUTPUT MODE					
SDI OUT	CAM	CAM, HD Q-TV	Switches the signals (main line HDSDI) that are output from the SDI-OUT connector. CAM : Outputs the main line signal. HD Q-TV : Outputs the Q-TV signal of the HDTV that is sent from the CCU/BS (if the CCU/BS is connected).	✓	-
MONITOR OUT	MON	MON, SYNC	MON: Outputs the mono analog HD signal for the monitor. SYNC: Outputs the tri-level sync signal.	✓	-
MON SDI OUT	VF	VF, MAIN, RETURN, HD Q-TV	Switches the signals (HD-SDI) output from the MON SDI OUT connector. VF : Outputs same signals as VF images. MAIN : Outputs main line signals. RETURN : Outputs RET signals.	✓	-
BARS MODE					
BARS MODE	Destination setting	FULL, MULTI	FULL : Displays the BARS signal conventionally used. MULTI : Displays the multiformat BARS signal.	✓	-
BARS ON	OFF	ON, OFF	Turns the color bar signal ON/OFF.	-	-
FAN CONTROL					
FAN CONT MODE	AUTO	AUTO, SLOW, QUIET, STOP	AUTO : Automatically changes the cooling fan speed according to the internal temperature level. SLOW : Sets the fan to SSLOW for 5 minutes. After 5 minutes, the mode changes to AUTO. QUIET : Stops the fan until the external temperature becomes about 35℃. Above that temperature the fan is operated automatically. STOP : Keeps the fan stopped as long as the internal temperature does not reach a critical level. If the power is turned on again, it returns to AUTO.	-	-
FRONT BOTTOM	---	(information display)	Displays the operation status of fan motor. SSLOW : Operates at the lowest speed SLOW : Operates at low speed NOR : Operates at normal speed FAST : Operates at high speed	-	-
BACKWARD BOTTOM	---			-	-
POWER BOX	---			-	-
VF CONT	---			-	-
FAN CONDITION					
FRONT BOTTOM	---	(information display)	OK : Normal NG : Fan is stopped.	-	-
BACKWARD BOTTOM	---				
POWER BOX	---				
H PHASE CONTROL			Adjusts the horizontal phase when using external synch.		
H PHASE	0.0	-100 to +100	Sets so that the phase of the internal SYNC signal matches the phase of the external SYNC signal. The internal SYNC advances in the direction of -100 in relation to the external synch, and delays in the direction of +100. Can only be set during self-operation.	-	-
TIME SETTING					
TIME	---	HH : MM : SS	Sets the time and date when saving the file to the memory card.	-	-
DATE(YY/MM/DD)	---	YY / MM / DD			
MEMORY CARD			Refer to "5.3 Using the Memory Card" for the memory card usage method.		
SAVE FILE					
ALL DATA	---		Saves the selected data to the memory card.	-	-
SNAP SHOT	---				
SCENE	---				
REFERENCE	---				
LENS	---				
MENU DATA	---				
LOAD FILE					
ALL DATA	---		Loads all files.	-	-
SNAP SHOT	---		Loads snapshot files.	-	-
SCENE	---	ALL, SELECT NUMBER	Possible to select whether to load all from SCENE DATA or to load individual data from 1 to 8.	-	-
REFERENCE	---		Loads the reference file.	-	-
LENS	---	ALL, SELECT NUMBER	Possible to select whether to load all from LENS DATA or to load individual data from 1 to 8.	-	-
MENU DATA	---	ALL, VF	Possible to select whether to load all menus from MENU DATA or only those menus related to VF.	-	-

■ *MENU (3/4)*

Menu Item	Initial setting	Setting value	Description, Remarks	MENU DATA ALL	MENU DATA VF
SCAN FORMAT SELECT					
SCAN MODE	Destination setting	1080I59, 1080I50, 1080P29SF, 1080P25SF	Selects the camera operation format. If BS/CCU is connected, the format on the BS/CCU side and the operation format will be the same.	-	-
CPU SYSTEM CONTROL					
SEMI SELF MODE	ON	OFF, ON	When disconnecting the remote controller and operating by the camera alone after adjusting the camera using the remote controller.	✓	-
AUTO IRIS SET					
IRIS SET MODE	OFF	OFF, ON	ON : Enables auto-iris operation setting. If set to ON, the iris adjustment from the remote controller is disabled.	-	-
IRIS LEVEL SET	0	-100 to +100	Adjusts the convergence level of auto iris. Shoot the registration chart with the camera and adjust the value so that the video level becomes 75%.	-	-
PEAK RATIO SET	-70	-100 to +100	Shoot the gray scale chart with the camera and adjust the value so that the video level is 100%. Set the exposure for a bright area in the "+" direction and for a dark area in the "-" direction. The default value "50" indicates no exposure compensation.	-	-
IRIS GAIN	50	1 to 100	Sets the auto-iris response sensitivity characteristics. The auto-iris operation sensitivity is such that "1" is low and "100" is high. Hunting tends to occur more often as the value goes up. (Set it to the default value "50" as long as hunting is not occurring).	-	-
IRIS SPEED	50	1 to 100	Sets the response speed characteristics of the auto-iris. The auto-iris speed becomes slower for "1" and faster for "100"..	✓	-
IRIS LIMIT	F22	F22, F20, F18, F16	If the iris is about to close during auto-iris operation, it stops the iris operation before it completely closes to prevent iris hunting. Sets the iris limit value at that time.	✓	-
LENS ADJUST	OFF	OFF, F2.8, F16	Sets the output of control voltage for fixed iris value during lens adjustment. To adjust the relationship between the lens control voltage value and lens iris value, the control voltage equivalent of F2.8 and F16 can be output to the lens.	-	-
AUTO SETUP MODE					
AUTO SETUP	LEVEL	FULL, QUICK, F.QUICK AWS, ABS, AWB, ABB LEVEL	Performs each AUTO SETUP. Refer to "Performing the auto setup" for details.		
FULL AUTO REF	INT	INT, EXT	Sets the reference for the FULL AUTO SETUP. INT : Sets to the default factory setting. EXT : Sets to the user setting.		
AWB WITH A.IRIS	OFF	ON, OFF	Selects whether to automatically include the A.IRIS when the AWB is performed. This menu is enabled only during the self-operation. It is always "OFF" during the CCU/BS operation.	✓	-
SMOOTH AWB	ON-0.5s	OFF, ON-0.3s, ON-0.5s, ON-0.7s, ON-1.0s, ON-1.5s, ON-2.0s	Smoothly switches between Ach/Bch for the AWB. You can set the transition time for the switching.	✓	-
AWB REFERENCE	ON	ON, OFF	ON : Makes the convergence value of the AWB converged to the EXT AWB REF. OFF : Calibrates the Rch/Bch to the Gch.	✓	-
ABS MODE	NORMAL	NORMAL, APS, P ONLY	Switches the auto-adjust modes of the AUTO BLACK SHADING (ABS). NORMAL : Performs the ABS. APS : Performs the AUTO PEAK SHADING (APS) after performing the ABS. P ONLY : Only performs the APS, but not the ABS.	-	-
CHART SEARCH					
REFERENCE SET	ABB	ABB, AWB, FULL	Sets the reference value for the AUTO SETUP. FULL : Creates the reference value for all AUTO SETUP items.(Except for the convergence value of AWB) AWB : Creates the convergence value of AWB. ABB : Creates the reference value of ABB. *3	-	-
LENS SELECT					
NUMBER	OFF	OFF, NO.1 to NO.8	Select the lens file number. - If the lens code is obtained from the lens, (CODE SEL) is displayed on the back of the lens number display. - If AUTO SEL is ON, "AUTO SEL" is displayed on the back of the lens number display.	✓	-
NAME	(---------)	12 characters	Set the file name for each lens file. Attaching the lens model name, etc. will make it easier to know the correspondence between the lens number and lens.	-	-
( )	(---------)	AUTO SEL name display section	Displays the lens name obtained from the serial lens.	-	-

Menu Item	Initial setting	Setting value	Description, Remarks	MENU DATA	
				ALL	VF
EXTENDER	OFF	OFF, ON-1, ON-2	Displays the lens extender state,and can be switching the lens extender.	-	-
AUTO SEL	OFF	OFF, ON	The lens file number is switched automatically according to the model name obtained from the lens.	✓	-
FILE SET	OFF	OFF, MANUAL, AUTO	Refer to "5.2 Settings from the Menu [FILE SET]" for usage method.	-	-
LENS TYPE	OFF	OFF, C.PORTABLE, C.STUDIO, C.FIELD, F.PORTABLE, F.STUDIO, F.FIELD	To match the zoom tracking DTL operation characteristics with the lens zoom characteristics, set the time of the lens used in the camera. OFF : Game tracking DTL is OFF. C.PORTABLE : Canon portable lens C.STUDIO : Canon studio lens C.FIELD : Canon field lens F.PORTABLE : Fujinon portable lens F.STUDIO : Fujinon studio lens F.FIELD : Fujinon field lens Set by lens file (NO.1 to 8).	✓	-
AUTO x0.8 CONV	OFF	OFF, ON	Set automatic switching of the aspect ratio converter (X0.8) internal lens. If set to ON, it operates in linked motion with the output aspect ratio of the down converter to carry out automatic switching.	✓	-
LENS SERIAL I/F	ON	ON, OFF	Set whether to respond to the serial interface of the lens or not.	✓	-
LEVEL ADJUST					
MASTER GAMMA	0.0	-100 to +100	Sets the master gamma value. The gamma value decreases in the direction of "-100" and increases in the direction of "+100".	-	-
MASTER PED	0.0	-100 to +100	Sets the master pedestal value. The pedestal value decreases in the direction of "-100" and increases in the direction of "+100".	-	-
MASTER FLARE	0.0	-100 to +100	Sets the master flare value. The flare value decreases in the direction of "-100" and increases in the direction of "+100".	-	-
DTL GAIN	0.0	-100 to +100	Sets the detail amount. The detail amount decreases in the direction of "-100" and increases in the direction of "+100".	-	-
ADJ CLR	READY	READY, PUSH SET→CLR, CANCEL	Returns the settings changed with LEVEL ADJUST to the state prior to change as a group.	-	-
PROCESS MODE					
GAMMA TYPE	NORMAL	NORMAL, CUSTOM1 to 5	Selects the type of gamma curve. NORMAL : Normal gamma curve CUSTOM1-5 : Custom gamma curve (Refer to "MENU(3/4)>CUSTOM GAMMA DATA" for editing the custom gamma data.)	-	-
SMOOTH STEP GAIN	ON-0.5s	OFF, ON-0.3s, ON-0.5s, ON-0.7s, ON-1.0s, ON-1.5s, ON-2.0s	Changes the STEP GAIN step by step. Possible to choose the time until convergence.	✓	-
SMOOTH STEP ECC	ON-0.5s	OFF, ON-0.3s, ON-0.5s, ON-0.7s, ON-1.0s, ON-1.5s, ON-2.0s	Changes the STEP ECC step by step. Possible to choose the time until convergence.	✓	-
MATRIX	OFF	OFF, 1, 2, 3	There are independent settings for three channels of the matrix, which can be switched.	-	-
HI-LIGHT DTL	ON	OFF, ON	Possible to increase the DTL level of the highlight part.	-	-
GAIN	0.0	0 to 100 *4	Sets the level value to be emphasized. Level increases in the direction of +100.	-	-
LIMIT	0.0	-100 to +100 *4	Sets the upper limit for the emphasized DTD level. The "-100" direction lowers the limit. The "+100" direction raises the limit and lowers the DTL level.	-	-
SMOOTH KNEE	TYPE-1	OFF, TYPE1, TYPE2, TYPE3	SMOOTH KNEE is a function to adjust the compression level of the brightness signal with KNEE. It can be selected from the following three setting types. TYPE1 : The compression rate of brightness is low. TYPE2 : The compression rate of brightness is medium. TYPE3 : The compression rate of brightness is high.	-	-
DTL V FILTER	OFF	ON, OFF	If the V filter of the DTL is ON, the resolution feeling in direction V diminishes, making it possible to obtain an image with less noise.	✓	-
LINE MIX	OFF	ON, OFF	Can be turned on only when operating in 1080P29SF and 1080P25SF formats. Can reduce resolution in the vertical direction.	✓	-

Menu Item	Initial setting	Setting value	Description, Remarks	MENU DATA	
				ALL	VF
CUSTOM GAMMA DATA					
EASY MODE			Easy creation mode. Sets various parameters and creates the custom gamma data.		
DEFAULT RESET	---	READY, EXECUTE, CANCEL	Returns to the original custom gamma data. If you have saved the custom gamma data with the "SAVE" function, it returns to the saved data. The original data cannot be recovered once it is overwritten with the "SAVE" function.	-	-
SELECT	NORMAL	NORMAL, CINE1 to 2, CUSTOM1 to 5	Selects the gamma table to be created.	-	-
CURVE TYPE	---	NORMAL, LOG, SPECIAL	Sets the basic properties of gamma curve.	- *5	-
INITIAL GAIN	---	1.0 to 9.0	Sets the slope of gamma curve at around 0%. The curve rises steeply as the value increases.	- *5	-
18% GRAY	---	14.0% to 107.0%	Sets what level it should be after the gamma has been applied when converting from 18% level before applied.	- *5	-
DYNAMIC RANGE	---	100% to 600%	Sets the maximum level (the maximum input level to the gamma) before the gamma has been applied.	- *5	-
WHITE LIMIT	---	70% to 109%	Sets the white clip after the gamma has been applied.	- *5	-
CAL	OFF	OFF, CAL100%, CAL200%, CAL300%, CAL400%, CAL600%	Selects the test waveform (CAL) to check the gamma table.	-	-
SAVE	---	READY, EXECUTE, CANCEL	Saves the data that has been created. The data is temporary unless you save it. Therefore, the data will be cleared if you end the menu without saving it.	-	-
SHUTTER	OFF	OFF, PRESET, VARIABLE	Selects for the electronic shutter.	-	-
SHUTTER SPEED	1/100	PRESET:1/100 to 1/2000 VARIABLE: 1/63.4 to 1/1983	Switches the shutter speed. (When SHUTTER is in PRESET and VARIABLE only.)	-	-
GAMMA CURVE COPY	---	CUSTOM1 to 5 → CUSTOM1 to 5	Copies the gamma data that has been created into the other data in the camera.	-	-
SD MEMORY CARD				-	-
SAVE	---	---	Saves the custom gamma data in an SD card.	-	-
LOAD	---	---	Loads the custom gamma data from an SD card.	-	-
PRESET FILE LOAD			Function to load the user settings (ENGINEER SET FILE) or factory settings (FACTORY SET FILE) for the level adjustment or menu of the camera. Used to return the camera state back to the previous or initial settings.		
FILE SELECT	ENGINEER	ENGINEER, FACTORY	ENGINEER : Initializes the state back to the user setting. FACTORY : Initializes the state back to the initial factory setting.	-	-
LOAD START	READY	READY, START, CANCEL	Executes initialization.	-	-

*3 : No. 2 of S11 on the MPU module must to be "ON" when creating the reference file.
Make sure to turn off the camera when selecting the switch.
Make sure turn off No. 2 of S11 after creating the reference file.
It is not necessary to turn on this switch when creating the reference file from the control panel.
*4 : If the manual set value is set with the control panel, the variable value can change with the manual set value.
Ex.) The value varies between -50 and +50 in the menu when the manual set of the GAIN is set at 50.
*5 : CUSTOM GAMMA MODE - Loads the custom gamma data from SD card through the LOAD menu.

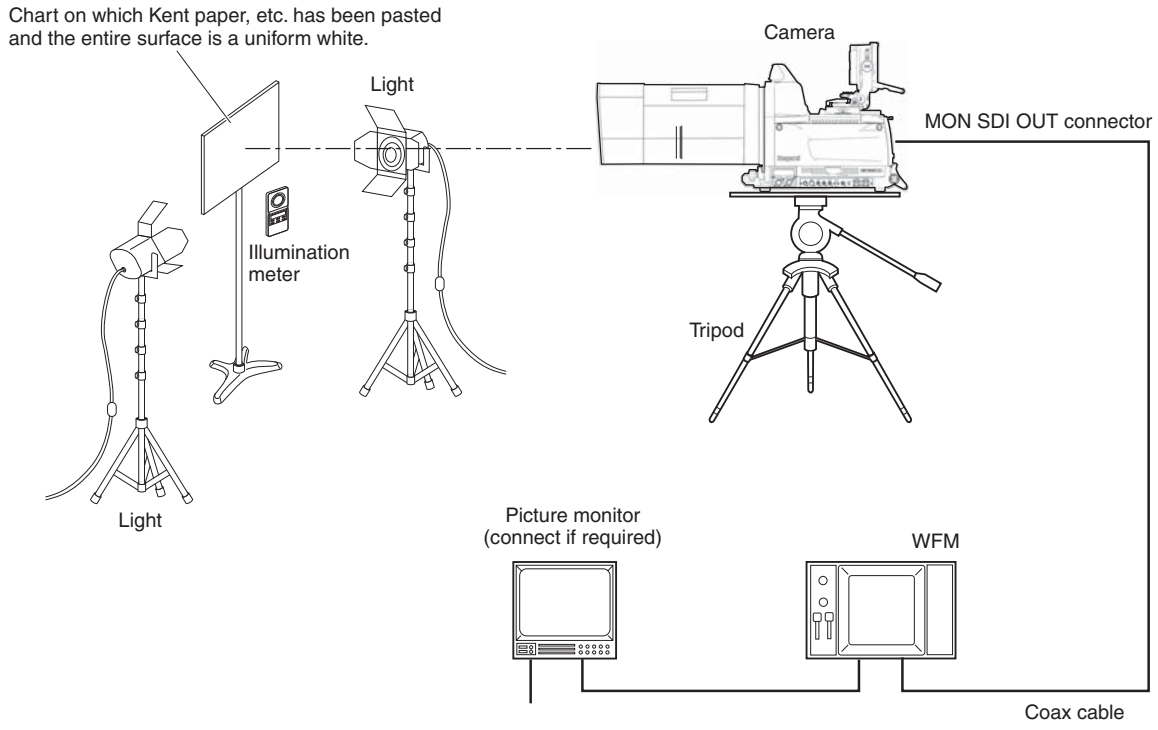
■ *MENU (4/4)*

Menu Item	Initial setting	Setting value	Description, Remarks	MENU DATA	
				ALL	VF
DIGITAL EXTENDER MODE					
DIGITAL EXTENDER	OFF	OFF, ON	Selects ON/OFF for the digital extender.	✓	-
MAGNIFICATION	x1.5	x1.5, x2, x3, x4	Selects the magnification of the digital extender.	✓	-
HEAD SW CONTROL	ENABLE	ENABLE, DISABLE	Sets whether to allow or restrict the digital extender control from the rotary encoder switch on the camera.	✓	-
PUSH SET SW	ON/OFF	ON/OFF, MAG	Sets whether to have ON/OFF option only or to include a control option for the magnification when the digital extender is controlled from the switch on the camera.	✓	-
MENU MODE					
ENGINEER MENU	OFF	OFF, ON	If set to ON, possible to display engineer menu. If the camera power is turned OFF, this menu setting returns to OFF.	-	-

■ *FILE SET*

FILE SET creates a lens file.
To change the settings, select “LENS SELECT” on MENU (3/4), then “FILE SET”.
The following explains the set values, descriptions, and setting procedures.

Set Value	Description
OFF (default)	Does not create lens files.
MANUAL	Stores the current lens status as a file. (“LENS No. x” will be displayed at the bottom of the screen.)
AUTO	Starts auto setup for lens file creation. (“PUSH SET -> START” will be displayed and flash at the bottom of the screen.)



Note:

- The creation of lens file requires precise adjustment; therefore, lens files are protected against unintentional update by the S11-4 DIP switch of the MPU module.
- When creating a lens file, set the optical filter to ND:100% and the ECC filter to 3200K. Also confirm that no special effect filter is attached to the front of the lens or internal filter disk. If a special effect filter is attached, it may not be possible to correctly create the lens file.
- When operating the DIP switch (S11) in the MPU module, turn the POWER switch of the camera OFF once.

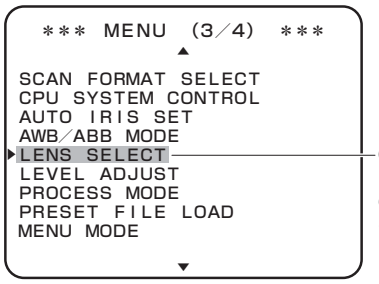
1 Set the camera for level setup.

- Mount the standard lens, which is used as a reference lens, to the camera.
- Chart on which Kent paper, etc. has been pasted and the entire surface is uniform white is used for the photographic subject.
- Use an illumination meter to adjust the light so that light is evenly distributed over the whole chart.

2 Dip switch S11-4 On allows creation of a lens file, Off prohibits creation of new lens files.

3 On MENU (3/4), turn the MENU SELECT switch to position the cursor on “LENS SELECT,” and press the MENU SELECT switch.

The submenu is displayed.



4 Set “NUMBER", “NAME” and “EXTENDER".

Refer to the explanation of corresponding item for how to set each data.
NO.1 is selected here as an example.

Caution:

If a new file is created with the same file number as an existing file, the data will be overwritten and the old data will be lost.

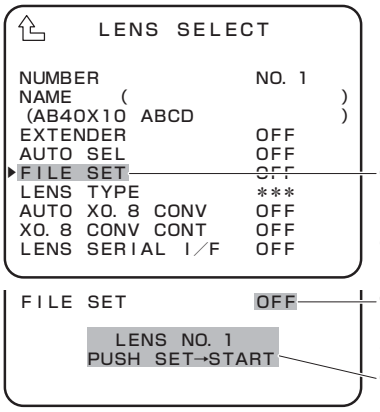
5 Turn the MENU SELECT switch to position the cursor on “FILE SET,” and press the MENU SELECT switch.

The cursor moves to the mode selection column.

6 Turn the MENU SELECT switch to select the set value, and press the MENU SELECT switch.

The value is confirmed, and either of the following messages is displayed at the bottom of the screen:
- LENS No. x : Displayed when “MANUAL” is selected.
- PUSH SET -> START : Displayed and flashes when “AUTO” is selected.

Go to Step 7 when “AUTO” is selected.
When “MANUAL” is selected, go to Step M1 to obtain the model name of the lens after lens file items such as GAIN/FLARE/GAMMA are adjusted by MCP, etc.



7 Press the MENU SELECT switch.

The lens file is created.

8 Set the S11-4 DIP switch of the MPU module back to “OFF”.

Note:

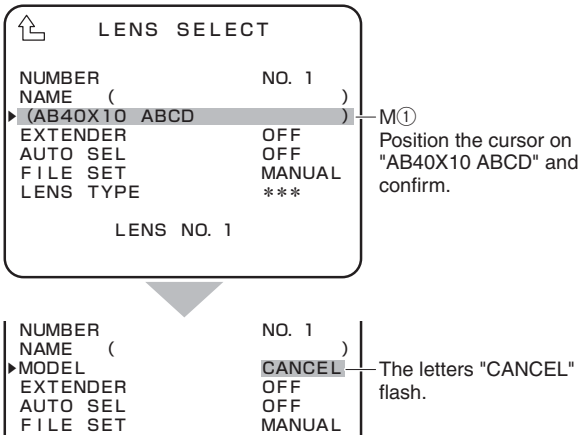
- When the camera is powered OFF, the FILE SET settings are turned OFF.
- Before creating lens files, prepare all the lenses to use. Then, create the files under the same condition at a time. If the conditions are changed, the setting cannot be accurate. Lens files memorize a difference in level between lenses. If the lighting or chart is changed, it cannot tell whether it is the lighting error, chart error, or lens error.

M1 Turn the MENU SELECT switch to position the cursor on the AUTO SEL NAME display part (AB40X10 ABCD), and press the MENU SELECT switch.

The screen switches to a display for obtaining a new model number from the lens, and the letters “CANCEL” flash.

Note:

“(AB40X10 ABCD)” is used here for an example of the model name automatically and previously obtained from the lens.

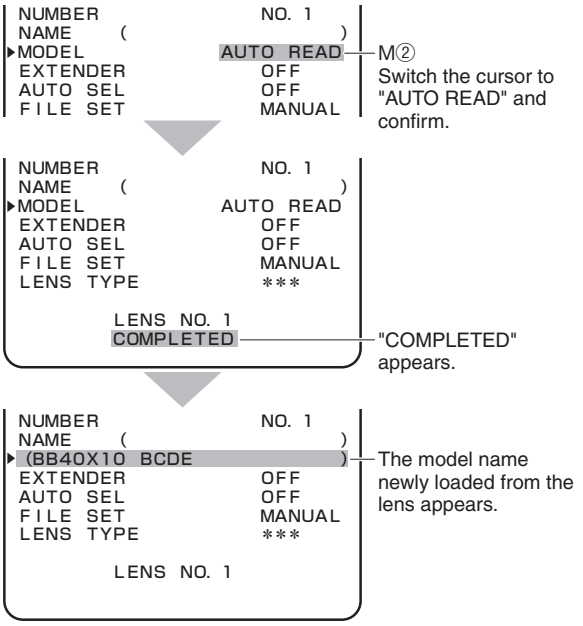


M2 Turn the MENU SELECT switch to switch the cursor on “CANCEL” to “AUTO READ”, and press the MENU SELECT switch.

- “COMPLETED” appears on the bottom.
- When “COMPLETED” disappears, a newly loaded model name will appear.

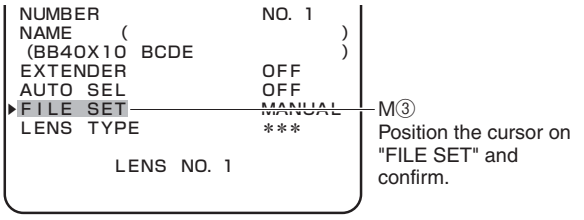
Note:

“(BB40X10 BCDE)” is used here for an example of the model name automatically and newly obtained from the lens.

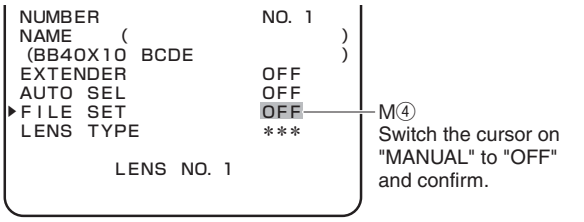


M3 Turn the MENU SELECT switch to position the cursor on “FILE SET”, and press the MENU SELECT switch.

The cursor moves to the mode selection column.

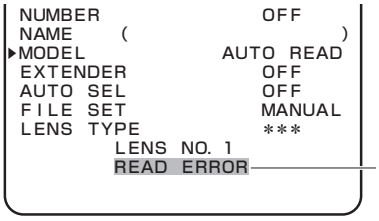


M4 Turn the MENU SELECT switch to move the cursor from “MANUAL” to “OFF”, and then press the MENU SELECT switch to complete the lens file creation. Then, go to the step 8.

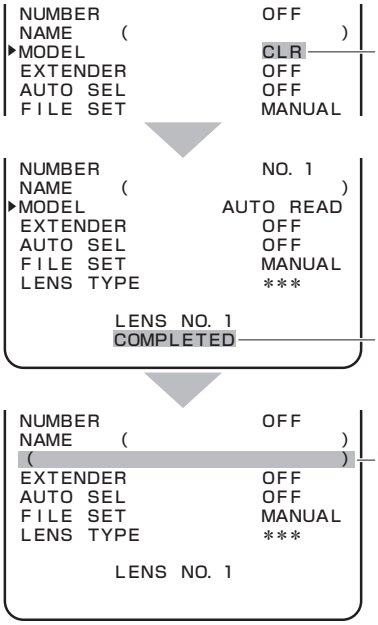


Note:

- When the new model name cannot be loaded from the lens, “READ ERROR” appears on the bottom instead of “COMPLETED”.



- When the MENU SELECT switch is turned to switch the cursor on “CANCEL” to “CLR” and the MENU SELECT switch is pressed in Step M2, “COMPLETED” appears on the bottom. Next, when “COMPLETED” disappears, the area to display a model name automatically obtained from the lens will be blank.



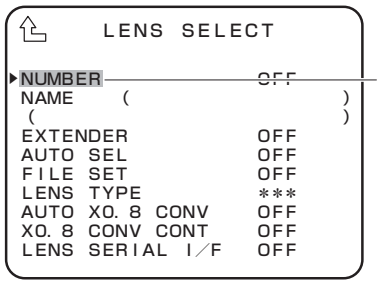
Note:

The lens name used for “AUTO SEL” can be edited so that the lens file can be shared with a similar lens. The following explains the procedures.

E1 Follow Steps 1 to 3 of lens file creation to display the submenu.

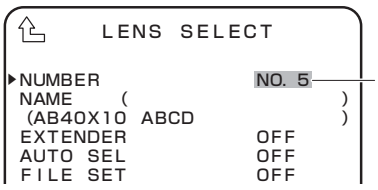
E2 Turn the MENU SELECT switch to position the cursor on “NUMBER”, and press the MENU SELECT switch.

The registered lens numbers (NO. 1 to NO. 8) are displayed.



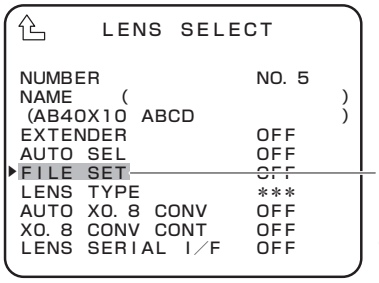
E3 Turn the MENU SELECT switch to position the cursor on the lens number of the file name to be edited, and press the MENU SELECT switch.

The NO.5 lens set in “AUTO SEL” is selected here as an example and the AUTO SEL NAME display part displays “AB40X10 ABCD”.

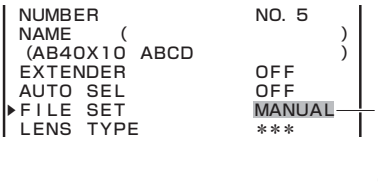


E4 Turn the MENU SELECT switch to position the cursor on “FILE SET”, and press the MENU SELECT switch.

The cursor moves to the mode selection column.

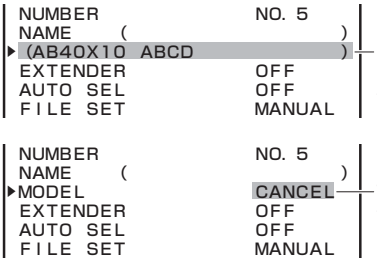


E5 Turn the MENU SELECT switch to position the cursor on “MANUAL”, and press the MENU SELECT switch.



E6 Turn the MENU SELECT switch to position the cursor on the AUTO SEL NAME display part, and press the MENU SELECT switch.

The item changes to “MODEL”, and the letters “CANCEL” flash.

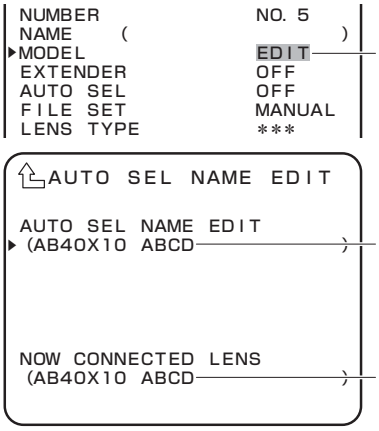


Reference:

If “AUTO SEL NAME” is not set, the AUTO SEL NAME display part does not display the lens model name.
Connect the target lens, perform “AUTO READ”, and then follow the procedures below.
Refer to Steps M1 and M2 for performing “AUTO READ”.

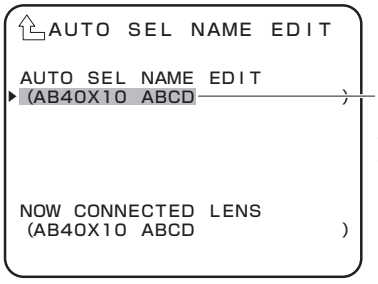
E7 Turn the MENU SELECT switch to switch the cursor from “CANCEL” to “EDIT”, and press the MENU SELECT switch.

The under submenu “AUTO SEL NAME EDIT” is displayed.



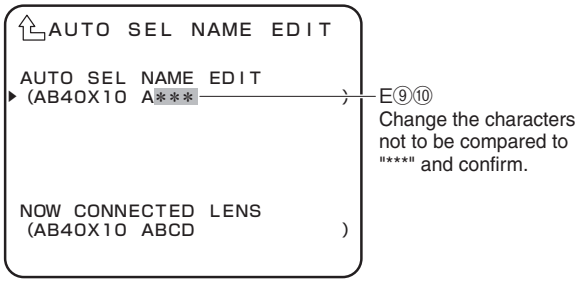
E8 Turn the MENU SELECT switch to position the cursor on the part for displaying the lens name to be edited, and press the MENU SELECT switch.

The item changes to the edit mode and ( ) at both ends flash.



E9 Turn the MENU SELECT switch to edit the lens name. Use "*" for the characters that are not to be compared in "AUTO SEL".

"AB40X10 A" are to be compared and the following "BCD" are not to be compared here as an example. Editing the lens name in this way allows you to apply the same lens file to the following two lenses.
- "AB40X10 ABCD"
- "AB40X10 AEFG"



E10 After editing the lens name, press the MENU SELECT switch and confirm.

The edit mode is terminated and ( ) at both ends stop flashing.
Now go to Step M3.

Caution:

1. The processing for "AUTO READ" is as follows:
   * When a serial lens is connected
     The model name of the serial lens currently connected is set for "AUTO SEL NAME".
   * When no lens is connected or an analog lens is connected
     The registered "AUTO SEL NAME" is retained.
2. "AUTO SEL NAME EDIT" can be set regardless of whether a lens is connected or not.
3. "AUTO SEL NAME EDIT" is a function to edit the model name read through "AUTO READ".
4. This function is not available if the model name of the target serial lens has not been obtained through "AUTO READ".

5.3 Using the Memory Card

The memory card can be used to store/read the setting condition of the camera.
For the memory card, it is possible to use the SD/SDHC memory card with the following specifications.

-Memory capacity : SD card from 32 MBytes to 2 GBytes.
SDHC card from 4 GBytes to 32 GBytes.
-Format : Format meeting standards of SD/SDHC memory card.

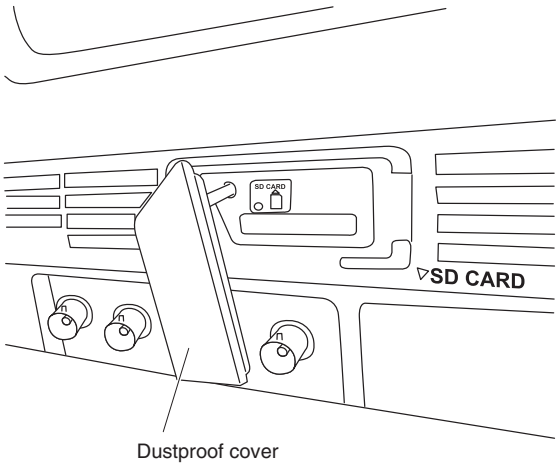
Caution:

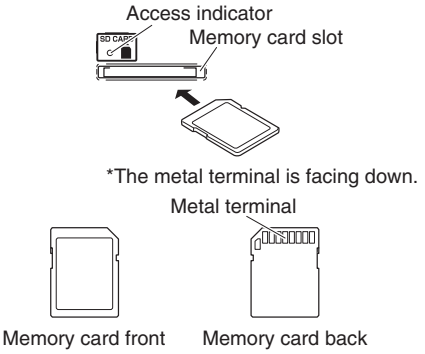
Market-sold memory cards have undergone sufficient confirmation of operation at this company. However, we cannot assume any responsibility for guaranteeing operation.

■ *Inserting and removing the memory card*

There is a memory card slot as shown in the illustration below on the bottom left side of the camera main unit.
Open the dustproof cover and insert the memory card in the memory card slot.

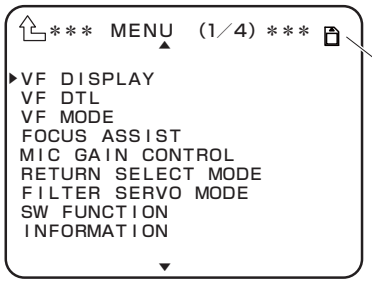
Camera Left View





Caution:

When inserting the memory card in the slot, be sure that the memory card is facing in the correct direction.



If the camera is recognizing the memory card normally, the memory card mark is displayed in the upper right of the VF menu screen.

When removing the memory card from the card slot, gently press the memory card until there is a clicking sound and then carefully remove the card.

■ *Storing the camera setting state on the memory card*

Store the camera setting state on the memory card. First confirm that the write protect switch of the memory card is not on the LOCK side.

1 Turn the MENU SELECT switch on MENU (2/4), set the cursor to [MEMORY CARD] and press the SET button.

The submenu is displayed.

2 Select [SAVE FILE] and press the SET button.

The SAVE FILE submenu is displayed.

3 Select the item from the SAVE FILE submenu that you wish to save.

Select ALL DATA on the picture.

4 After selecting the item you wish to save, press the SET button. Then use the MENU SELECT switch and SET button to insert an eight-character file name.
When the eight character file name has been determined, [PUSH SET -> START] is displayed on the cursor.
Press the SET button.If a file of the same file name exists on the memory card at this time, proceed to step M1. If you wish to cancel, turn the MENU SELECT switch when [PUSH SET -> START] is displayed.

5 When the file is being saved, [SAVING FILE] is displayed.
If the file is saved normally, [COMPLETE] is displayed.

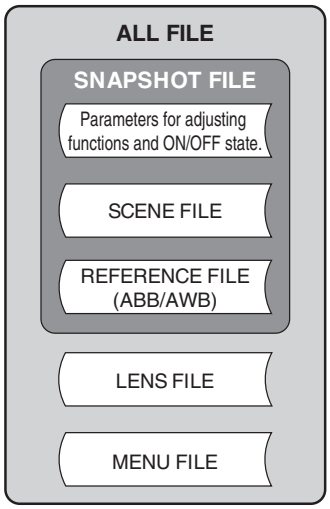
Caution:

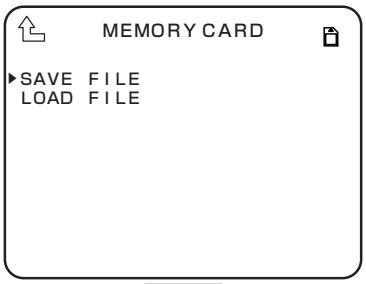
Never remove the memory card from the slot during display of [SAVING FILE] or while the access indicator is lighted, as data is being written to the memory card. Removing it at this time could damage the memory card data or the memory card itself.

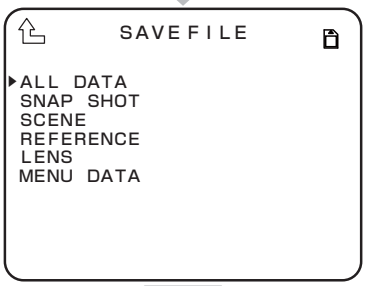
M1 If a file with the same file name exists on the memory card, a message is displayed asking whether it is all right to write over the data. To enable writing over of data, change [NO] to [YES] and press the SET button. If [NO] has been selected, storage is cancelled and the system returns to step [3].

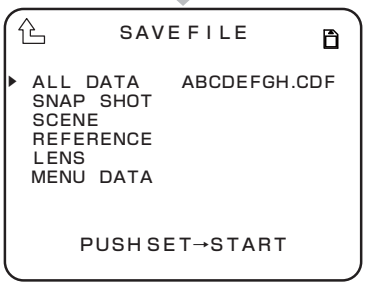
Note:

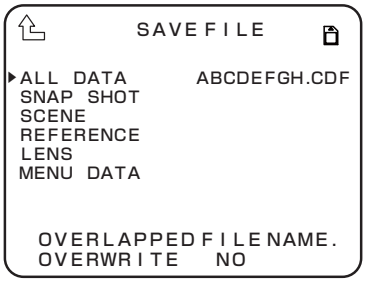
The images of the storage range for files are shown in the figure below.











■ *Reading the camera setting condition from the memory card.*

Read the camera setting condition from the memory card.

1 Turn the MENU SELECT switch on MENU (2/4) to adjust the cursor to [MEMORY CARD] and press the SET button.

The submenu is displayed.

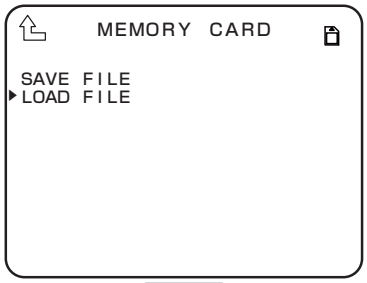
2 Select [LOAD FILE] and press the SET button.

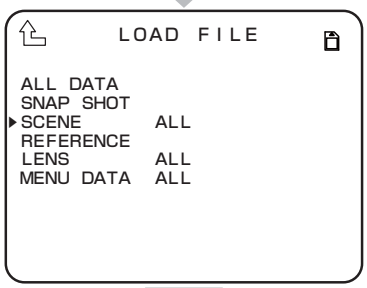
The LOAD FILE submenu is displayed.

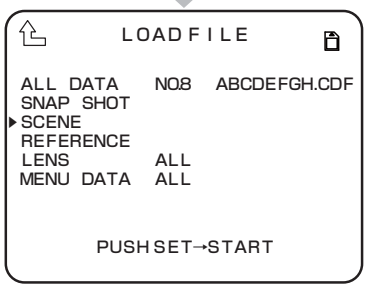
3 Select the item you which to read to the camera from the LOAD FILE submenu.

In the figure, [SCENE] is selected.

4 After selecting the item to be read to the camera, press the SET button.
Then select whether to read all files or individual files from No. 1 to No. 8. In the example in the figure, No. 8 is selected. Then select a file stored on the memory card.
After the contents are determined, [PUSH SET -> START] is displayed. Press the SET button.
If you wish to cancel, turn the MENU SELECT switch when [PUSH SET -> START] is displayed.







Note:

SCENE FILE, LENS FILE, MENU DATA is about, it is possible to select individual data (ALL) or all data.

-SCENE	:	ALL , NO.1-NO.8
-LENS FILE	:	ALL , NO
-MENU DATA	:	ALL , VF

5 When the file is being saved, [SAVING FILE] is displayed. If the file is saved normally, [COMPLETE] is displayed.If ALL FILE and MENU DATA have been read, the camera is automatically restarted after display of [COMPLETE].

Caution:

Never remove the memory card from the slot during display of [SAVING FILE] or while the access indicator is lighted, as data is being written to the memory card. Removing it at this time could damage the memory card data or the memory card itself.

Caution:

If changes as those listed below have been made in the file name stored to a PC, etc., it is not possible to display the file name normally.
-If a file name with more than 8 characters has been set.
-Using file names (kanji, kana, etc.) composed of characters other than half-size letters of the alphabet.

■ *Error Messages*

If an error is generated when saving or reading files, various error messages are displayed. The error messages and contents are as shown below.

Error Message	Contents
NO CARD	Memory card not inserted.
CANNOT OPEN FILE	File cannot be opened.
NOT CAMERA DATA FILE.	Not a camera data file.
FILE OF DIFFERENT CAMERA.	Different type of file.
RELEVANT DATA IS NOT FOUND.	Relevant data cannot be found.
WIRTE ERROR	Write error.
READ ERROR	Read error.
ERROR	Other error.

TROUBLE SHOOTING and MAINTENANCE

6

Refer to this chapter when the alarm lamp lights or when you want to know about the maintenance during the use of this product.

■ ***Problems***
- The alarm lamp on the OCP or on the MCP flashes ON and OFF.
- “TEMP!!” or “FAN!!” appears on the viewfinder screen.

■ ***Questions***
- How to reset the settings to default (Return to the factory settings)

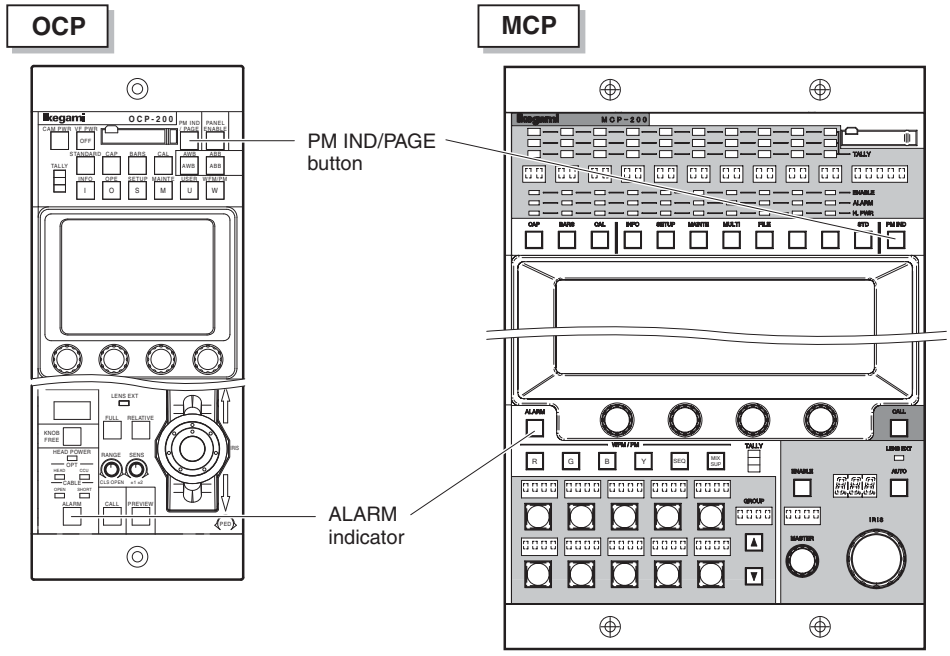
■ ***Maintenance***
- Cleaning the camera connectors
- Resetting the breaker

6.1 Alarm Lamp on the OCP or MCP Flashes ON and OFF

The CCU is equipped with a self diagnostic function which monitors whether the CCU and camera are running normal. As soon as the CCU main power switch is turned ON, the self diagnostic function starts running, and always runs during operation.
If the CCU or camera becomes abnormal, the diagnostic function immediately detects the abnormality, and the ALARM indicator on the OCP or MCP flashes ON and OFF. Furthermore, the self diagnostic information screen appears on the PM, so that you can locate the trouble point.

Note:

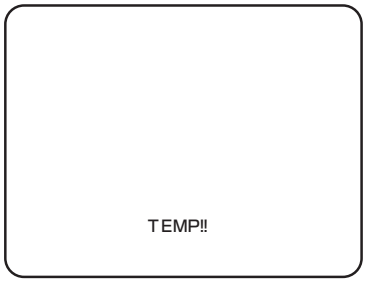
Even if the ALARM indicator does not flash, you can check whether CCU and camera are running normal by pressing the PM IND/PAGE button on the OCP or on the MCP to display the self diagnostic screen on the PM.



For the list of self diagnostic information of CCU-970, refer to the relevant operation manual. Perform the appropriate action referring to the list.

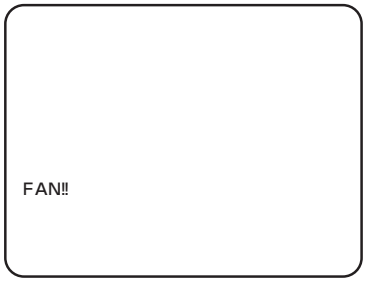
6.2 “TEMP!!” or “FAN!!” Appears on the VF Screen

When the temperature inside the camera increases abnormally, a warning indicating an abnormal temperature rise flashes on the viewfinder screen.



Status	Cause	Action
TEMP!! flashing	The camera is exposed to direct sunlight for many hours.	Put a sunshade cover on the camera to avoid direct sunlight.
	The camera is used near some heating appliance.	Move the position of the camera or heating appliance.

If a fan stops due to some failure, a warning indicating an irregular fan stop flashes on the viewfinder screen.



Status	Cause	Action
FAN!! flashing	Fan stops.	Inspect the fan for any problem.

Note:

To prevent temperature increase inside the camera, cooling fans are provided at the top of the camera and fiber adaptor.
See “5. CAMERA SETTINGS and ADJUSTMENT [Menu Configuration and content]” for how to check which fan stops.

6.3 Initializing the Settings of this Product

The following two cases are available for initializing the setting of this product.

① Initializes the camera back to the user setting (ENGINEER SET FILE).
This initializes the camera back to the state set by user engineer in advance in response to the environment and the shooting conditions.

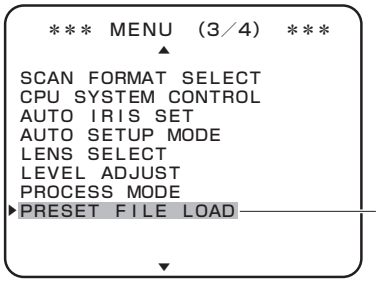
② Initializes the camera back to the initial factory setting (FACTORY SET FILE)
This initializes the camera back to the initial factory setting.

To change the settings, select “PRESET FILE LOAD” on MENU (3/4), then “FILE SELECT” and “LOAD START”.
The following explains the set values, descriptions, and setting procedures.

Set Value		Description
FILE SELECT	ENGINEER (default)	Initializes the state back to the user setting.
	FACTORY	Initializes the state back to the initial factory setting.
LOAD START	READY (default)	The state before initialization
	START	Starts initialization.
	CANCEL	Cancels initialization.

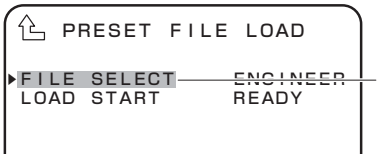
1 On MENU (3/4), turn the MENU SELECT switch to position the cursor on “PRESET FILE LOAD”, and press the MENU SELECT switch.

The submenu is displayed.



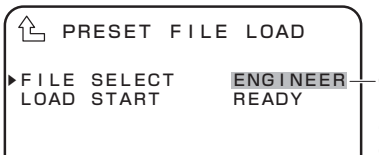
2 Turn the MENU SELECT switch to position the cursor on “FILE SELECT”, and press the MENU SELECT switch.

The cursor moves to the mode selection column.



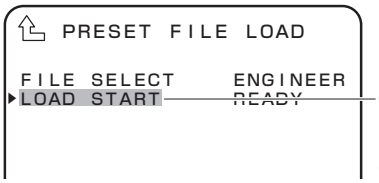
3 Turn the MENU SELECT switch to select the value to be set, and press the MENU SELECT switch.

The value is confirmed.



4 Press the MENU SELECT switch when the cursor automatically moves to “LOAD START”.

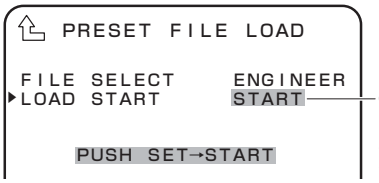
The cursor moves to the mode selection column and its display changes from “READY” to “START”.



5 Turn the MENU SELECT switch to select the set value, and press the MENU SELECT switch.

The value is confirmed.
- Selecting “CANCEL” cancels the setting and terminates “PRESET FILE LOAD”.
- Selecting “START” displays “PUSH SET -> START” at the bottom of the screen.

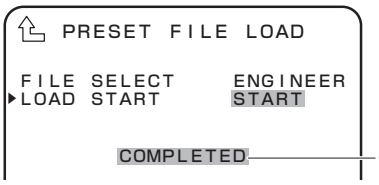
Go to Step 6 when selecting “START”.



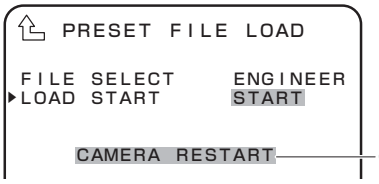
⑤ Select the set value and confirm.
- Selecting "START" displays a message at the bottom of the screen.

6 Press the MENU SELECT switch.

Initialization starts.
When the file load is completed, “COMPLETED” appears on the screen. Then, “CAMERA RESTART” blinks for about three seconds. After that, the camera restarts and the initialization is completed with the file selected in “FILE SELECT”.



⑥ "COMPLETED" is displayed at the bottom of the screen.

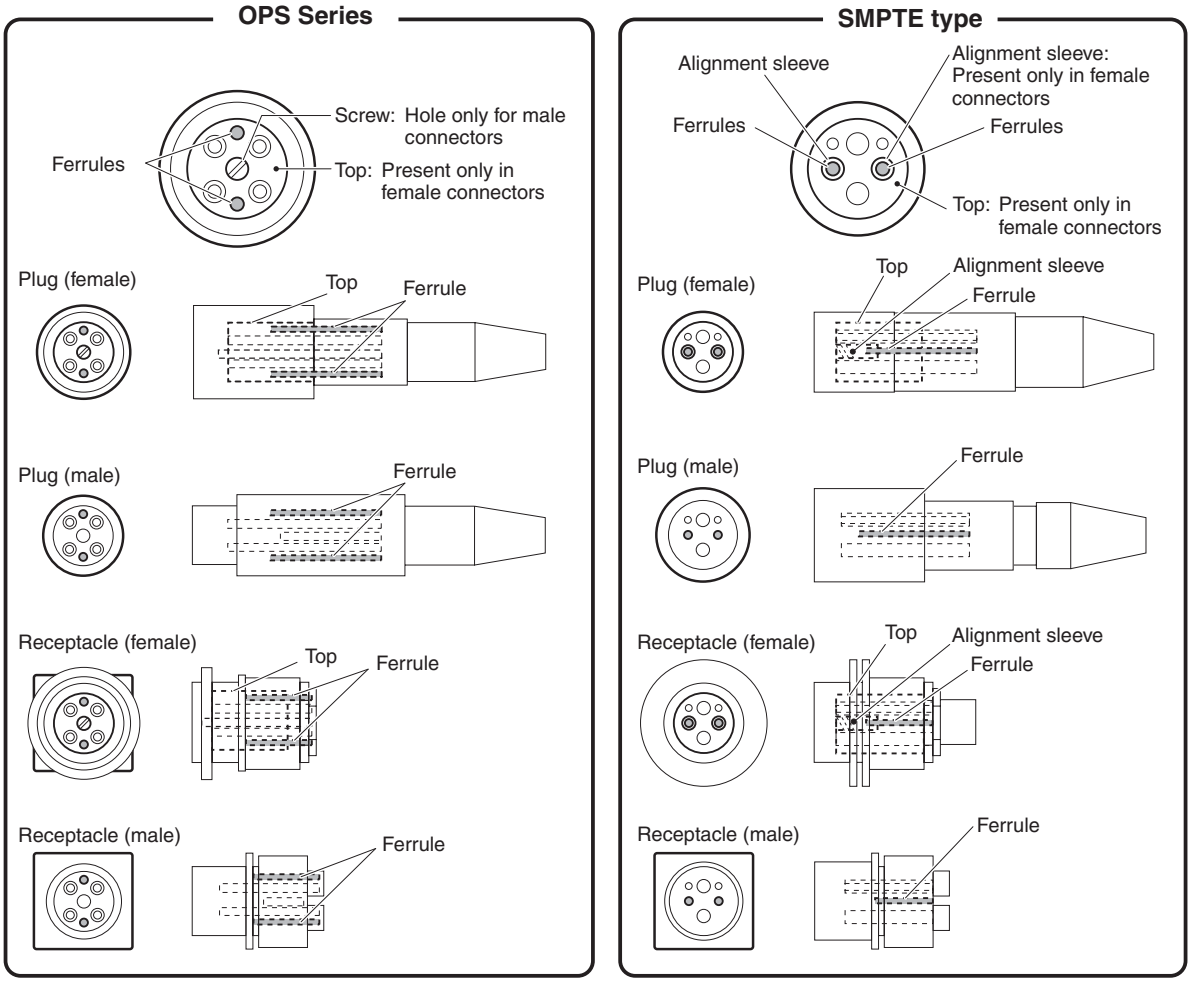


⑥ "CAMERA RESTART" is displayed at the bottom of the screen.

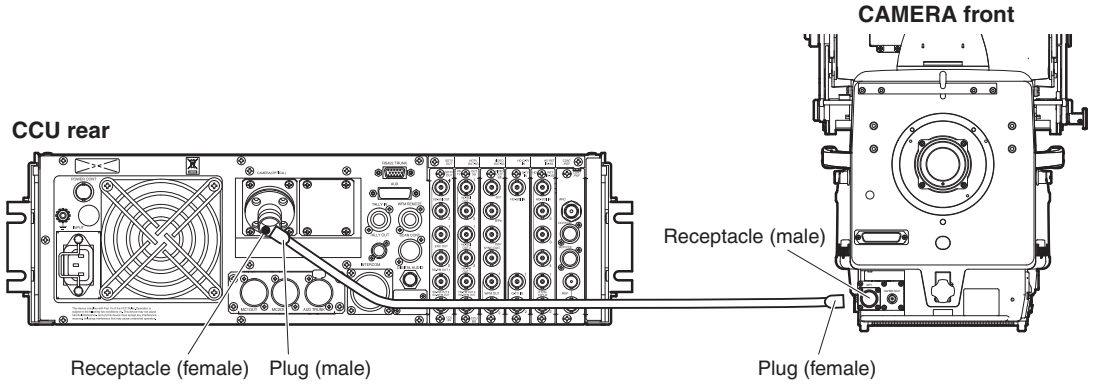
6.4 Cleaning Camera Connectors

The fiber cable connecting the camera and the CCU transmits optical signals through 10µm core glass fibers. If Ferrules, which secure glass fibers, are dirty or have dust on them, transmission loss (optical signal attenuation) occurs. If Ferrules are extremely dirty, optical signals are interrupted and the fiber cable may not work properly. Regular cleaning of Ferrules is suggested if the camera connector is frequently removed and inserted. The figures below show the shape of the camera connector joint section, location of the Ferrules, and how to clean the Ferrules:

● ***Camera Connector Joint Section***



● ***Male and Female Camera Connectors***



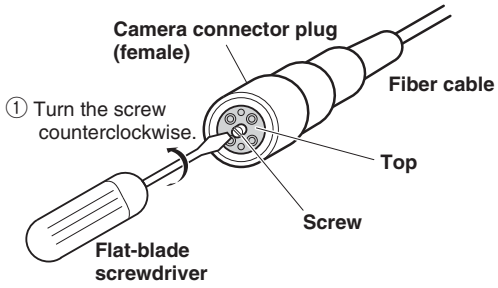
Clean the four sections: receptacle (male) on the camera head, receptacle (female) on the CCU, and plugs (male and female) on both ends of the fiber cable. The cleaning method for male connectors slightly differs from that for female connectors. There is no difference between receptacles and plugs in the cleaning method.

■ *OPS Series Connectors*

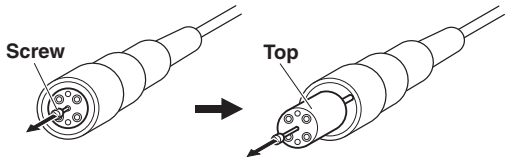
The following explains how to clean Ferrules using a Tajimi OPS series fiber cable plug (female) as an example.

1 Loosen the screw at the center of the connector with a flat-blade screwdriver or a coin.

After turned 9 or 10 turns counterclockwise, the screw will come out. The screw is not removed because it is attached to the top.



2 Pull the screw and remove the top from the connector.

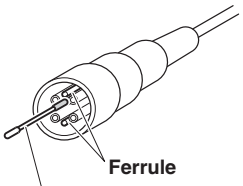


② Pull the screw to remove the top from the connector.

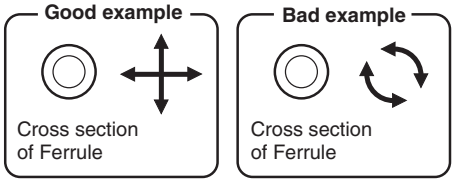
3 Wipe the Ferrule with a cotton swab dampened with alcohol.

Caution:

- When you wipe the Ferrule, move the cotton swab straight in a way in which you brush the dust off the Ferrule. Do not wipe back and forth or in a circle. Doing so may spread the dirt instead of removing it.
- Do not carelessly blow your breath on the Ferrule.



③ Wipe with a cotton swab dampened with alcohol.



4 After wiping the Ferrule with alcohol, wipe the Ferrule with a dry cotton swab.

5 Make sure that the dirt is removed.

Use a loupe to examine the Ferrule.

6 If the Ferrule is free from dirt, align the top with the connector guide and put it back in the connector.

Be sure to push the top securely into the connector.

7 Tighten the screw with a flat-blade screwdriver or a coin.

Camera male connectors have no “top” regardless of whether they are receptacles or plugs. For male connectors, therefore, steps 1, 2, and 6 above are not required.

■ *SMPTE type Connectors*

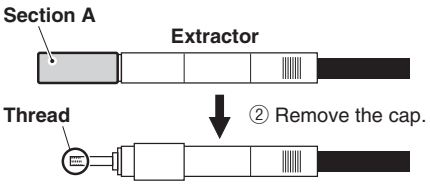
The following explains how to clean Ferrules using a SMPTE type (Lemo 3K series or compatible product) fiber cable plug (female) as an example.

Caution:

When removing the alignment sleeve, be sure to use a dedicated optical contact extractor (DCC.91.312.5LA). Also use the end of the extractor that has an inner thread.

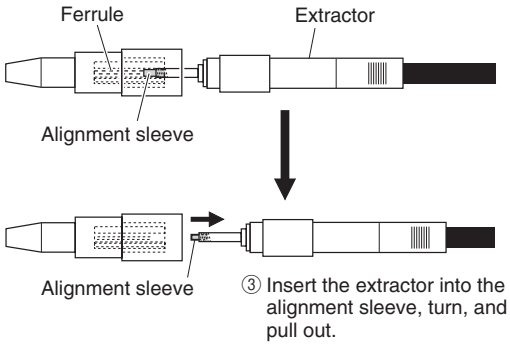
1 Prepare a dedicated extractor and place the extractor in a position parallel to the connector.

2 Remove the cap of section A (with a thread).



3 Insert the extractor into the alignment sleeve and turn the extractor clockwise 8 to 10 turns until it stops. When it stops, pull the extractor out straight.

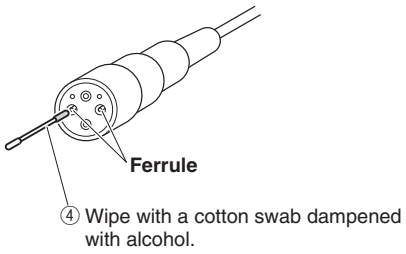
Leave the alignment sleeve attached to the extractor.



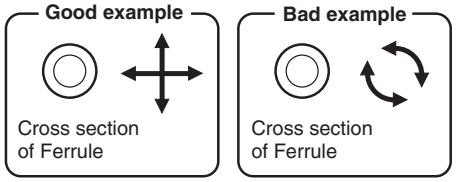
4 Wipe the Ferrule with a cotton swab dampened with alcohol.

Caution:

- When you wipe the Ferrule, move the cotton swab straight in a way in which you brush the dust off the Ferrule. Do not wipe back and forth or in a circle. Doing so may spread the dirt instead of removing it.
- Do not carelessly blow your breath on the Ferrule.



5 After wiping the Ferrule with alcohol, wipe the Ferrule with a dry cotton swab.



6 Make sure that the dirt is removed.

Use a loupe to examine the Ferrule.

7 Wipe the electrical contact and alignment sleeve in the same way.

8 Insert the alignment sleeve into the optical contact until it clicks and turn the extractor counterclockwise 8 to 10 turns.

The extractor is removed from the alignment sleeve.

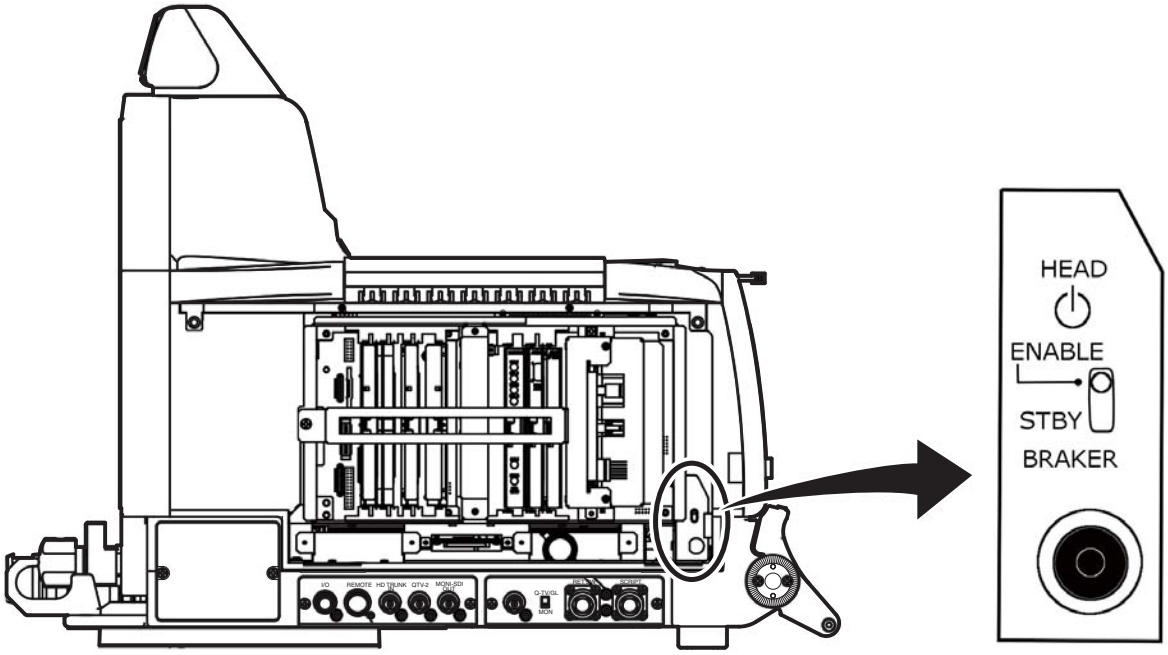
Camera male connectors have neither “top” nor “alignment sleeve” regardless of whether they are receptacles or plugs. For male connectors, therefore, steps 1 to 3 and 8 above are not required.

6.5 Reset the Breaker

If power is not being supplied to the camera even though the power is on and peripherals are connected correctly, it might mean that the power has been cut off by the breaker. In this case, reset the breaker as follows:

1 Check that the camera's POWER switch is OFF.

2 Push down the breaker on the right side of the camera.



6.6 Replacing the fuse

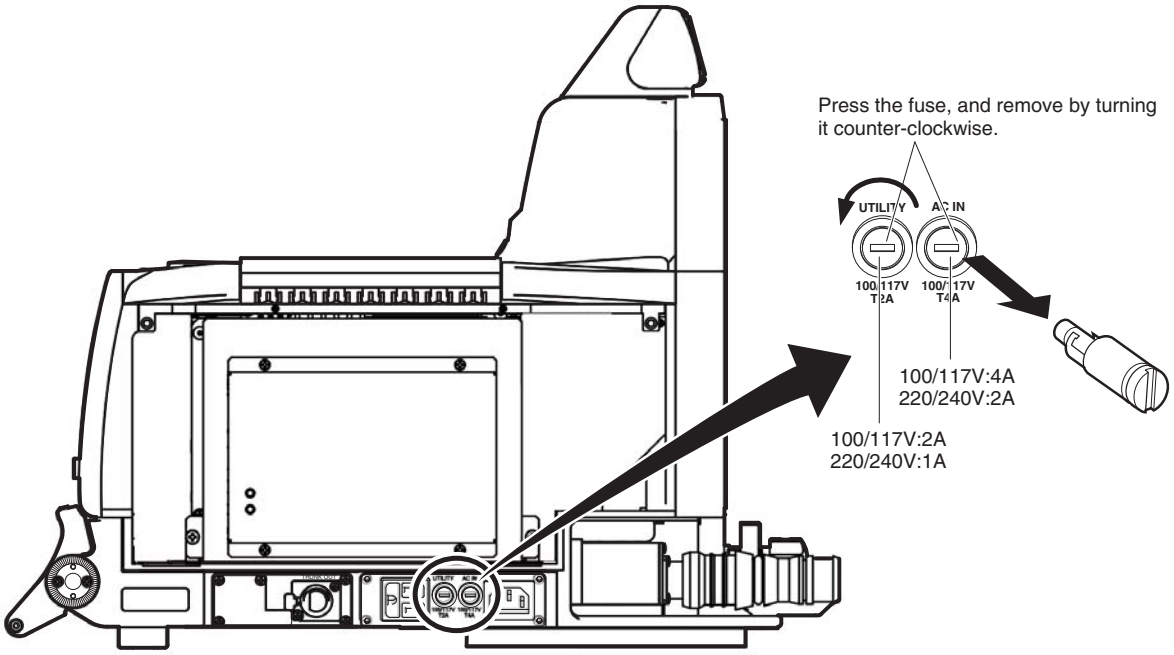
If this product cannot be turned on when the power supply and peripherals are connected properly, the fuse may be blown. In that case, replace the fuse.

Caution:

Use the specified fuse or equivalent.

1 Make sure the MAIN POWER switch on the CCU is set to “OFF”.

2 Push the fuse on the left side of the camera using a flat-blade screwdriver, and then turn it counterclockwise to remove.



3 Insert a new fuse and turn it clockwise using a flat-blade screwdriver until it seats firmly.

7

SPECIFICATIONS

7.1 HDK-790GX Specifications

■ Ratings

	Item	Rating						Remarks
1	Scanning system	1080/59.94i 1080/50i 1080/29.97psF 1080/25psF						Y:Pb:Pr 4:2:2
2	Image sensor	2/3 inch CCD sensor						Total pixels 2.3M
3	Effective number of pixels	1920 (H) × 1080 (V)						
4	Sensitivity	F10 1080i/59.94						2000LX reflection rate 89.9% Sensitivity in 1080i/59.94.
5	Optical system	2/3 type, R,G,B 3CCD Sensor f/1.4						
6	Lens mount	BTA S-1005B						
7	Camera connector	Tajimi OPS or Lemo 3K Series (EDW) compatible type						Factory option
8	Optical filter		1	2	3	4	5	
		ND	100%	25%	6.2%	1.6%	CAP	
			I	II	III	IV	V	
		EFFECT	Clear	Cross	Snow	Fog	Clear	
9	Electric color conversion		A	B	C	D	E	
		ECC	3200K	4300K	5600K	6300K	8000K	
10	Sampling frequency	74.25 MHz/1.001 or 74.25 MHz						
11	Quantization bit	16 bit						
12	VF	7inch CRT, 9inch LCD						
13	Return video	4 channels						
14	Q-TV	2 channel MON/Q-TV1/SYNC-OUT : Select from MENU and SW Q-TV2 (Only)						When connected to BS/CCU for two-channel input.
15	Power source voltage	AC 100/110/117/220/240V ±10%						
16	Ambient temperature	Operation temperature : -20 ℃～ +45 ℃ Storage temperature : -30 ℃～ +60 ℃						
17	Ambient humidity	30% to 90%						No condensation.
18	EMI	FCC Class A						
19	External dimensions	Approx. W315 × H328.5 × D398 mm						Not including projections.
20	Weight	Approx. 24kg (except the VF and Lens)						

■ Performance

	Item	Rating	Remarks
1	S/N ratio	60dB (typ.) 1080i/59.94	Established at 1080i/59.94
2	Resolution (modulation depth)	45% (typ.)	Established at 1080i/59.94
3	Limiting resolution	1000 TVL (typ.)	Established at 1080i/59.94
4	Registration error	0.02% following	Not including lens distortion.
5	Contour correction	Horizontal boost frequency 13 MHz to 22 MHz	
6	GAIN	-6, -3, 0, +3, +6, +9, +12, +18 dB	
7	GAMMA	OFF, 0.35, 0.4, 0.45	
8	Electronic shutter	1/100, 1/120, 1/250, 1/500,1/1000, 1/2000	Electronic shutter mode
		1/15, 1/10, 1/8, 1/6, 1/5, 1/4, 1/3, 1/2, 1s	CCD accumulation mode
9	VF	75 VA or less (HDK-790GX only) 180 VA or less (HDK-790GX + CCU-970)	

■ Output signals

	Item	Rating	Remarks
1	Main line video signal	Y,Pb,Pr 4:2:2 digital serial (optical connector) Y,Pb,Pr 4:2:2 digital serial (75Ω BNC)	BTA S-004B compliant
2	Monitor video signal	75Ω BNC 1 channels HD SDI VF/RET/MAIN/HD-QTV	Select with MENU
3	Analog signal	75Ω BNC 1 channels MONI : HD Y signal SYNC : 0.6Vp-p (3level sync signal) QTV-OUT : VBS	Select with MENU and SW
4	Q-TV signal (2 system first)	75Ω BNC 1 channels QTV-OUT : VBS (Q-TV2)	BS/CCU required that can handle 2 channel input.
5	Intercom signal (Listen)	XLR-type 0 dBs 2 channels (INCOM-1,INCOM-2)	Line : PROD,ENG,PGM1,PGM2

■ Input signals

	Item	Rating	Remarks
1	External SYNC signal	75Ω BNC 1 channels (Combined analog signal output BNC) SYNC 0.6Vp-p ± 6dB	BB/PS signal
2	Audio signal	- 60 to +4dB (Variable) /-20dB (fixed)	600Ω balance 2 channels
3	Intercom signal (Talk)	XLR-type 2 channels (INCOM-1, INCOM-2)	ENG, PROD
4	External HD-SDI input signal	75Ω BNC 1 channels HD SDI 4:2:2	Correspondence Only BS / CCU during operation

■ Camera cables

	Item	Rating	Remarks
1	Standard cable	2SM - 9.2 - 37.5	
2	Studio-use cable	2SM - 16 - 37.5	
3	Cable configuration	Two single-mode type quartz fiber optic cables 4 power cables 2 control cables	HEAD-->CCU, CCU-->HEAD (one cable for each)
4	Power cables	37.5Ω/Km per cable	
5	Control cables	113Ω/Km per cable	

■ Applicable standards

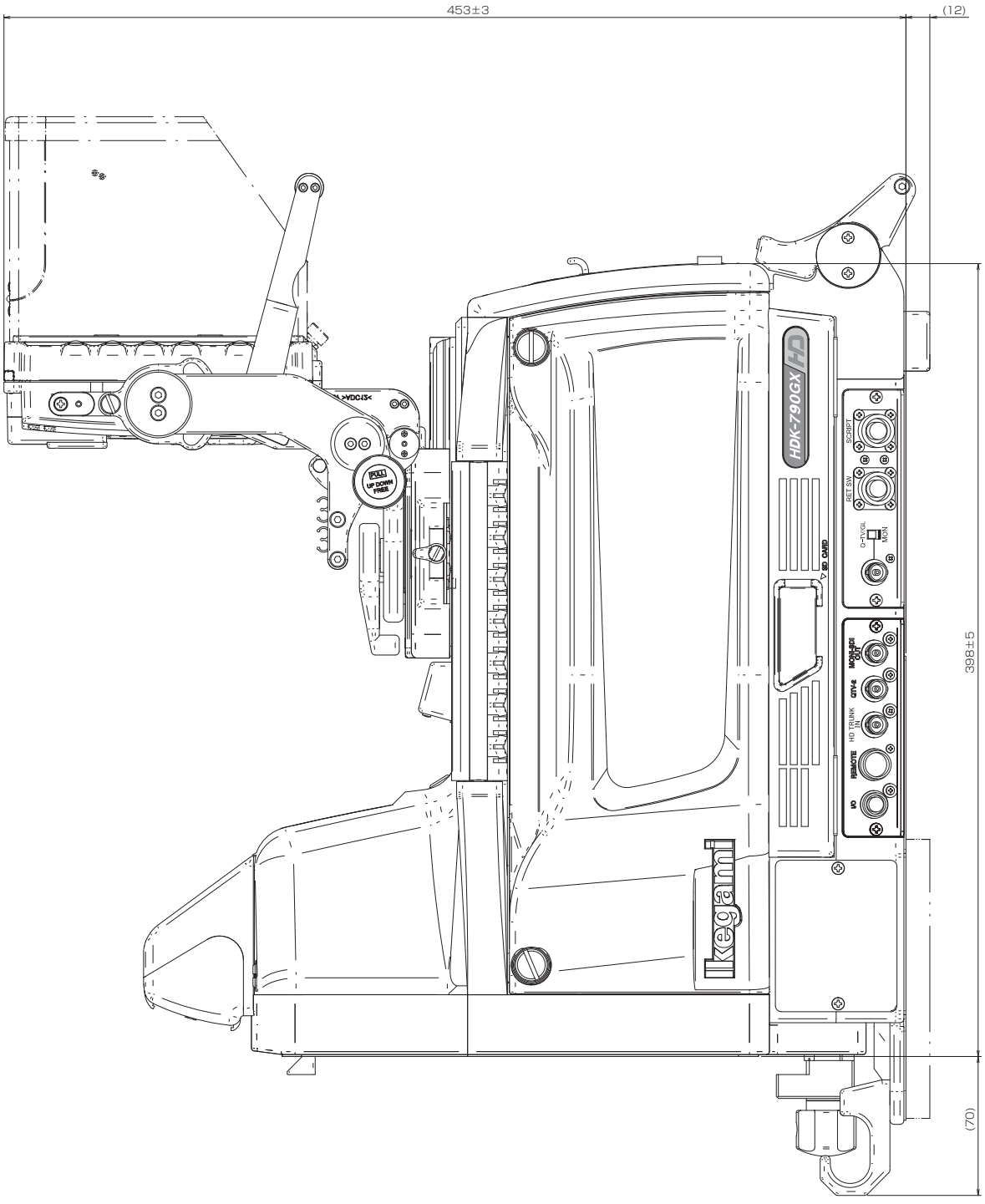
Safety Standards : CE mark

■ Use conditions

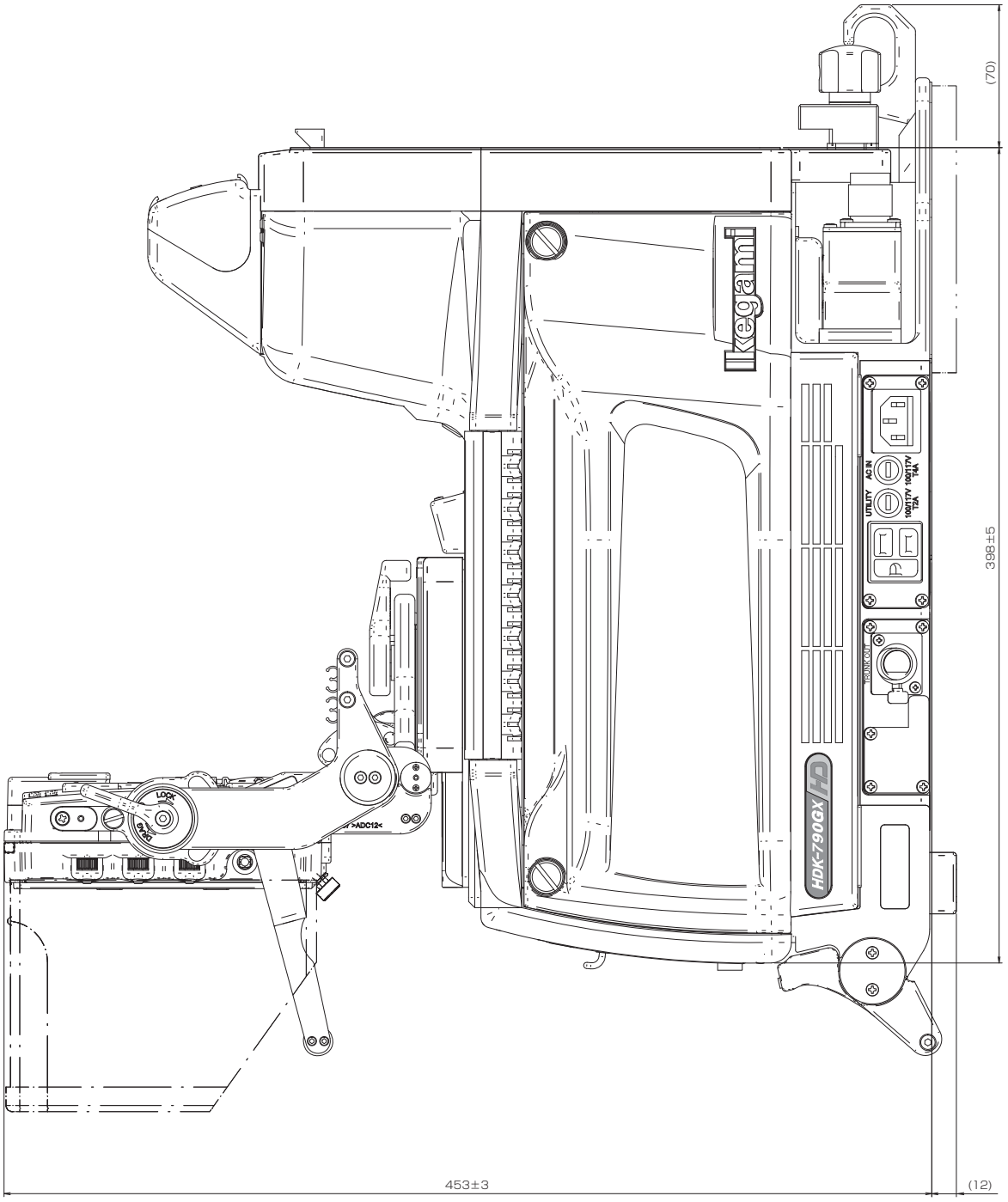
Electrical environment : Usually a short life (Except electric field strength, magnetic field strength, etc.)

7.2 External Dimensions Diagram

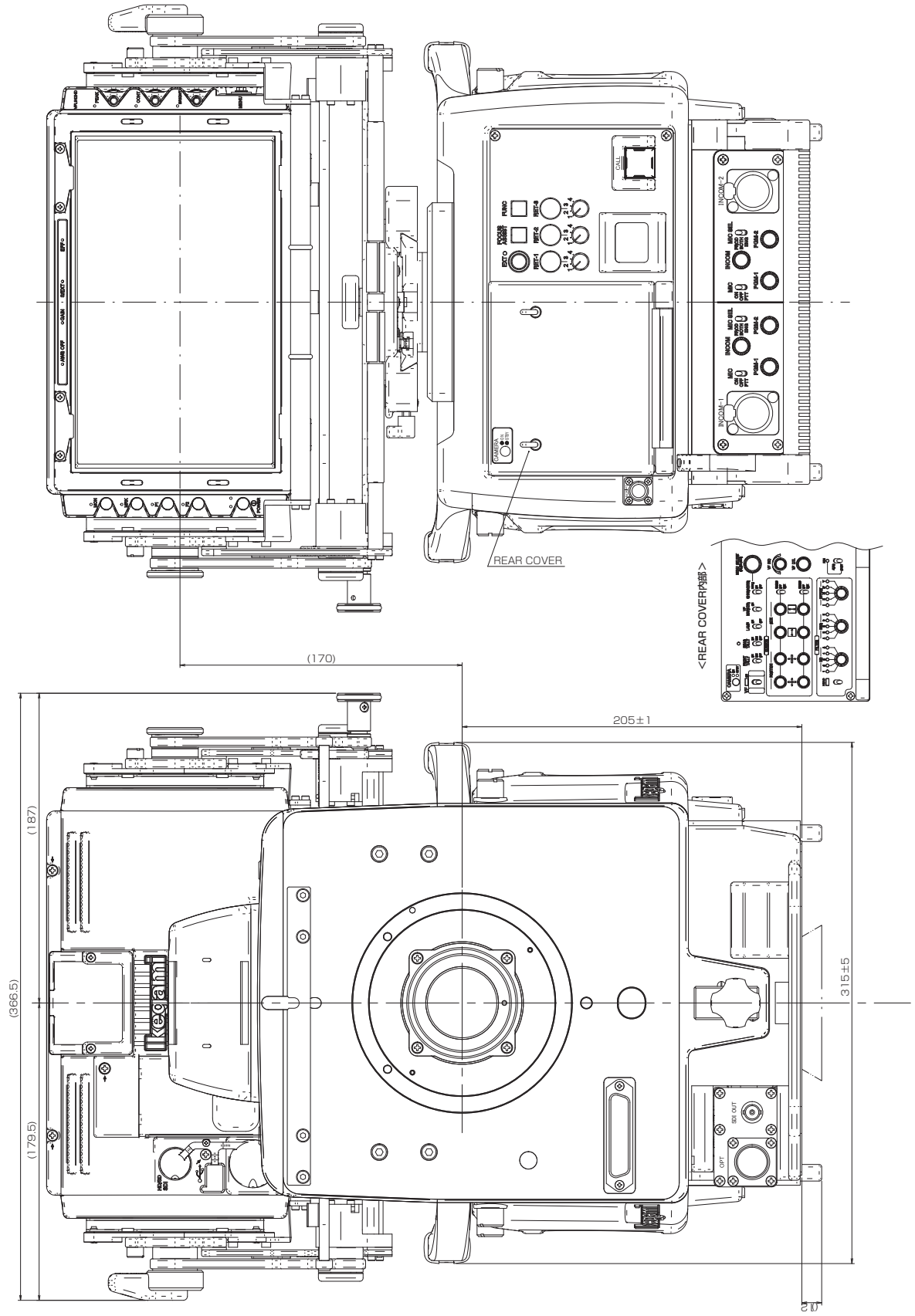
■ *Right Side View*



■ *Left Side View*



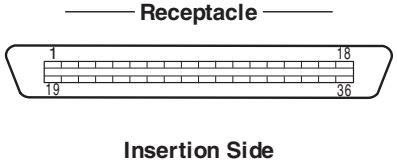
■ *Front and Rear View*



7.3 External Connections

■ *Lens Connector*

Used to connect each type of lens. The connector pin assignment differs among camera lens mount types.



Camera head side : 57-20360R (DDK)
Cable side : 57-20360S

[BTA Mount]

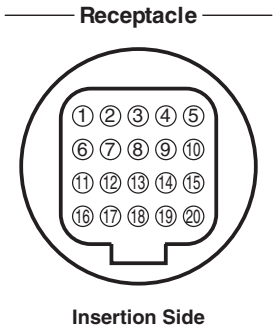
Pin No.	Name	Function	I/O	External Interface
①	N . C	————————	—	
②	N . C	————————	—	
③	N . C	————————	—	
④	+ 12 V (LENS)	DC + 12 V power supply to lens	OUT	
⑤	GND (LENS)	Ground for DC + 12 V power supply to lens	GND	
⑥	SIG GND	Ground for various control signals	GND	
⑦	BODY GND	Ground for chassis	GND	
⑧	EXT ANS 1	Command signal input from lens	IN	
⑨	EXT ANS 2	Command signal input from lens	IN	
⑩	EXT ANS 3	Command signal input from lens	IN	
⑪	LENS 16 : 9 / 4 : 3	Aspect ratio command signal output to lens	OUT	
⑫	IRIS POSITION	Lens iris position display signal input	IN	
⑬	ZOOM POSITION	Lens zoom position display signal input	IN	
⑭	RET - 1 ON	ON/OFF signal for RET-1 VIDEO	IN	
⑮	RET - 2 ON	ON/OFF signal for RET-2 VIDEO	IN	
⑯	FOCUS POSITION	Lens focus position display signal input	IN	
⑰	IRIS CONT	Lens iris control signal output	OUT	
⑱	IRIS AUTO / REM	Iris /remote switch control signal output	OUT	
⑲	N . C	————————	—	
⑳	N . C	————————	—	
㉑	LENS TALLY	Lens Tally ON/OFF signal	OUT	
㉒	N . C	————————	—	
㉓	N . C	————————	—	

Pin No.	Name	Function	I/O	External Interface
㉔	LENS CODE (A)	Lens code signal input from lens	IN	
㉕	LENS CODE (B)	Lens code signal input from lens	IN	
㉖	LENS CODE (C)	Lens code signal input from lens	IN	
㉗	LENS CODE (D)	Lens code signal input from lens	IN	
㉘	EXT CONT (A)	Control signal output to lens	OUT	
㉙	EXT CONT (B)	Control signal output to lens	OUT	
㉚	FOCUS FAR	Control signal input on the lens focus far side	IN	
㉛	INC - 1 E / P	ON/OFF signal for INC-1 audio signal	IN	
㉜	INC - 2 E / P	ON/OFF signal for INC-2 audio signal	IN	
㉝	INC - 1 MIC ON	ON/OFF signal for INC-1 microphone audio	IN	
㉞	INC - 2 MIC ON	ON/OFF signal for INC-2 microphone audio	IN	
㉟	FOCUS CONT	Control signal output for lens focus	OUT	
㊱	FOCUS NEAR	Control signal input for lens focus near side	IN	

IN : Camera←Lens
OUT : Camera→Lens

■ *VF Connector*

A connector used to connect the LCD viewfinder.



Camera head side : HR12-14RA-20SC

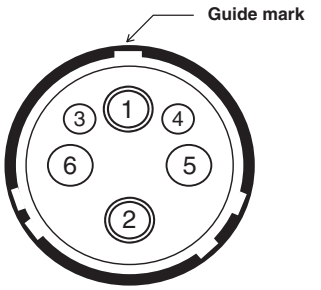
Pin No.	Name	Function	I/O	External Interface
①	+12V	DC +12V power supply	OUT	
②	+12V	DC +12V power supply	OUT	
③	N.C	————————————————————	—	
④	+12V RET (VF GND)	Ground for DC+12V power supply	RET	
⑤	+12V RET (VF GND)	Ground for DC+12V power supply	RET	
⑥	G/Y VF VIDEO	G/Y VF VIDEO output signal	OUT	⑥ ⑦ 75 Ω
⑦	G/Y VF VIDEO RET	Ground for G/Y VF VIDEO output signal	RET	
⑧	VF M CLK	Reference clock pulse signal for serial data reproduction	OUT	
⑨	SP WR	Read pulse signal for serial-parallel data conversion	OUT	
⑩	VF SP DATA	Serial data signal for serial-parallel data conversion	OUT	
⑪	+12V RET	Ground for DC+12V power supply	RET	
⑫	ZEBRA ON	ZEBRA signal ON/OFF switching	IN	
⑬	ZOOM POSI	Zoom position control	OUT	
⑭	(+9V)	————————————————————	—	
⑮	COLOR ON	Color VF control	IN	
⑯	B VF VIDEO	B VF VIDEO output signal	OUT	⑯ ⑰ 75 Ω
⑰	B VF VIDEO RET	Ground for B VF VIDEO output signal	RET	
⑱	R VF VIDEO	R VF VIDEO output signal	OUT	⑱ ⑲ 75 Ω
⑲	R VF VIDEO RET	Ground for R VF VIDEO output signal	RET	
⑳	+12V RET	Ground for DC+12V power supply	RET	

■ *CAMERA Connector*

Used to connect the camera to its CCU.
You can choose either of the following two types of camera connectors.

[SMPTE type]

Receptacle

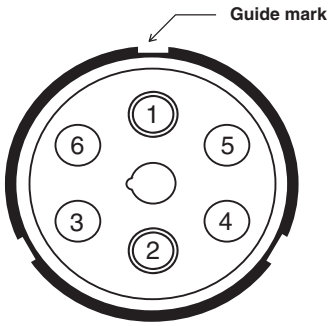


Insertion Side

< SMPTE type >
Camera head side : EDW. 3K. compatible product
Cable side : FUW. 3K.

[OPS Series]

Receptacle



Insertion Side

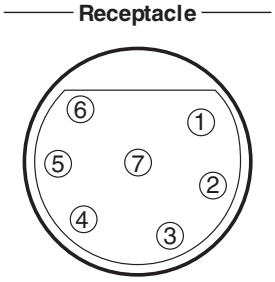
< OPS Series >
Camera head side : OPS-R
Cable side : OPS-P

Pin No.	Name	Function	I/O	External Interface
①	OPT H - B	Optical contact Camera -> CCU	OUT	
②	OPT B - H	Optical contact CCU -> Camera	IN	
③	CONTROL (H)	Control signal (H) CCU -> Camera	IN	
④	CONTROL (C)	Control signal (C) Camera -> CCU	OUT	
⑤	POWER (H)	Power (H) supplied from CCU	IN	
⑥	POWER (C)	Power (C) supplied from CCU	IN	

■ *INCOM1 and INCOM2 Connector*

Used to connect an intercom headset.
Each headset type has each connector shape.

[7-pin type]

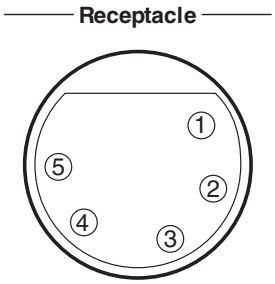


Insertion Side

Camera head side : NC7FDL-B-1 (NEUTRIK)
Cable side : XLR-7-12C (7-pin male plug) or equivalent

Pin No.	Name	Function	I/O	External Interface
①	LISTEN L (C)	Shield for intercom receiver L output (H) ⑪	RET	①, ② → Receiver L
②	LISTEN L (H)	Intercom receiver L output (H)	OUT	
③	TALK (C)	Shield for intercom microphone input (H) ③	RET	③, ④ → Intercom microphone
④	TALK (H)	Intercom microphone input (H)	IN	
⑤	COMM	COMM GND terminal ⑤	GND	
⑥	LISTEN R (H)	Intercom receiver R output (H)	OUT	⑥ → Receiver R, ⑦
⑦	LISTEN R (C)	Shield for intercom receiver R output (H) ⑦	RET	

[5-pin type]

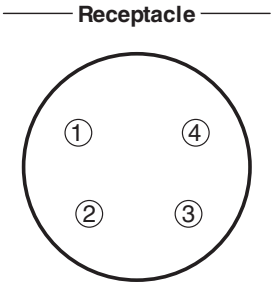


Insertion Side

Camera head side : NC5FDL-B-1 (NEUTRIK)
Cable side : XLR-5-12C (5-pin male plug) or equivalent

Pin No.	Name	Function	I/O	External Interface
①	TALK (C)	Shield for intercom microphone input (H)	GND	①, ② ← Intercom microphone
②	TALK (H)	Intercom microphone input	IN	
③	SHIELD	Shield for LISTEN L / LISTEN R output	GND	③, ④ → Receiver
④	LISTEN Lch (H)	LISTEN L output (H)	OUT	
⑤	PGM Rch (H)	PGM R output (H)	OUT	⑤ → Receiver

[4-pin type]

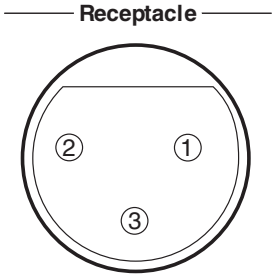


Insertion Side

Camera head side : NC4MDL-B-1 (NEUTRIK)
Cable side : XLR-4-11C (4-pin male plug) or equivalent

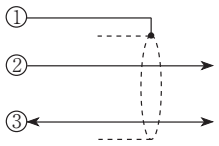
Pin No.	Name	Function	I/O	External Interface
①	TALK (C)	Shield for intercom microphone input (H)	GND	①, ② ← Intercom microphone
②	TALK (H)	Intercom microphone input	IN	
③	LISTEN (C)	Shield for LISTEN output (H) output	GND	③, ④ → Receiver
④	LISTEN (H)	LISTEN output (H)	OUT	

[3-pin type]

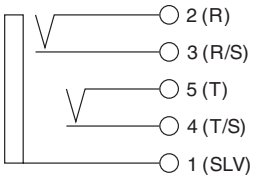


Insertion Side

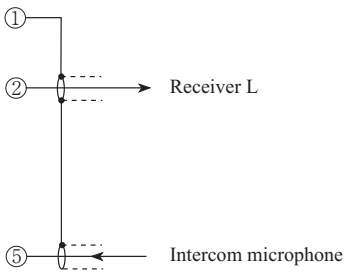
Camera head side : NC3FDL-B-1 (NEUTRIK)
Cable side : XLR-3-12C (3-pin male plug) or equivalent

Pin No.	Name	Function	I/O	External Interface
①	COMMON GND	Shield for intercom microphone	GND	
②	POWER	Microphone power supply output	OUT	
③	TALK	Intercom microphone input/output	IN/ OUT	

[114B Jack]



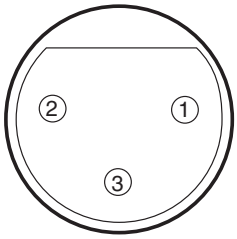
Camera head side : 114B (SWITCH CRAFT)
Cable side : 110 phone plug

Pin No.	Name	Function	I/O	External Interface
①	COMM	COMM GND terminal Connects to SLV (sleeve) of the plug	GND	
②	LISTEN L (H)	Intercom receiver output (H) Connects to R (ring) of the plug	OUT	
③	LISTEN L (C)	Termination when the plug is removed	OUT	
④	TALK (C)	Termination when the plug is removed	IN	
⑤	TALK (H)	Intercom receiver input (H) Connects to T (tip) of the plug	IN	

■ *MIC-1 and MIC-2 Connector*

Used to connect for input to a microphone. (600Ω balanced input)

Receptacle



Insertion Side

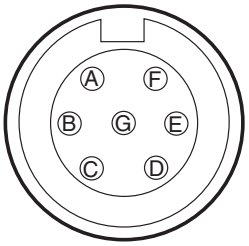
Camera head side : XLR-3-31-F77 (JAE)
Cable side : XLR-3-12C (3-pin male plug) or equivalent

Pin No.	Name	Function	I/O	External Interface
①	MIC (SHIELD)	MIC input shield	—	
②	MIC (HOT)	MIC (HOT) line 600Ω balanced input When AB power is supplied : DC 12V When +48 phantom power is supplied : DC 48V	IN	
③	MIC (COLD)	MIC (COLD) line 600Ω balanced input When AB power is supplied : DC 0V When +48 phantom power is supplied : DC 48V	IN	

■ *RET SW Connector*

A connector used to connect with RETURN SW BOX.

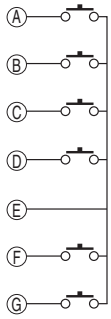
Receptacle



Insertion Side

Camera head side : PRC03-21A10-7F (Tajimi)
Cable side : PRC03-12A10-7M10.5 (7-pin female plug)

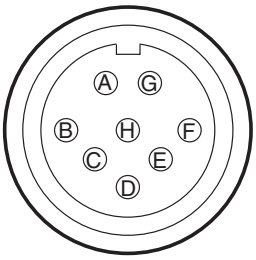
Pin No.	Name	Function	I/O	External Interface
Ⓐ	PET - 1 CONT	RETURN-1 select signal input	IN	
Ⓑ	PET - 2 CONT	RETURN-2 select signal input	IN	
Ⓒ	PROD MIC - ONF (H)	CONTROL signal (H) for PROD MIC - ON / OFF	IN	
Ⓓ	ENG MIC - ONF (H)	CONTROL signal (H) for ENG MIC - ON / OFF	IN	
Ⓔ	COMMON	GND for signal input	GND	
Ⓕ	EXT - 2 CONT	LENS EXTENDER2 select signal input	IN	
Ⓖ	EXT - 1 CONT	LENS EXTENDER1 select signal input	IN	



■ *REMOTE Connector*

Used to connect an external remote controller.

Receptacle

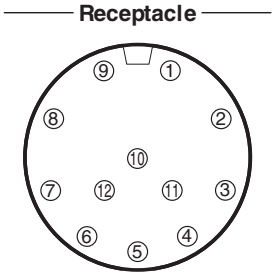


Insertion Side

Camera head side : PRC05-R8F (Tajimi)
Cable side : PRC05-PB8M (8-pin male plug)

Pin No.	Name	Function	I/O	External Interface
Ⓐ	HED (+)	Digital data output (+) from camera to remote controller	OUT	
Ⓑ	HED (-)	Digital data output (-) from camera to remote controller	OUT	
Ⓒ	HEC (+)	Digital data input (+) from remote controller to camera	IN	
Ⓓ	HEC (-)	Digital data input (-) from remote controller to camera	IN	
Ⓔ	+ 12 V (REM)	DC+12V power supply to remote controller	OUT	
Ⓕ	+ 12 V RET (REM)	Ground for DC+12V power supply	RET	
Ⓖ	REM LISTEN	Intercom input from remote controller	IN	
Ⓗ	REM TALK	Intercom output to remote controller	OUT	

■ I/O Connector



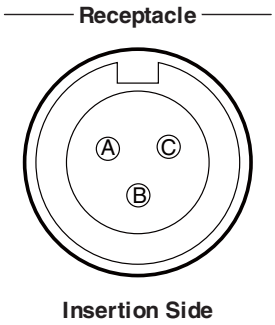
Insertion Side

Camera head side : HR10A-10R-12SC (HRS)
Cable side : HR10A-10P-12PC

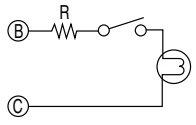
Pin No.	Name	Function	I/O	External Interface
①	PC RXD (+)	Digital data input (+) from remote controller to camera	IN	
②	PC RXD (-)	Digital data input (-) from remote controller to camera	IN	
③	PC TXD (+)	Digital data output (+) from camera to remote controller	OUT	
④	PC TXD (-)	Digital data output (-) from camera to remote controller	OUT	
⑤	+ 12 V RET	Ground for DC+12V power supply	RET	
⑥	+ 12 V	DC+12V power supply to remote controller	OUT	
⑦	R TALLY	ON/OFF signal for R Tally	OUT	
⑧	G TALLY	ON/OFF signal for G Tally	OUT	
⑨	RET -1	ON/OFF signal for RET-1	IN	
⑩	RET -2	ON/OFF signal for RET-2	IN	
⑪	NC	————————	—	
⑫	NC	————————	—	

■ SCRIPT Connector

A connector used to supply the power to a script lamp.



Camera head side : PRC03-21A10-3AF (Tajimi)
Cable side : PRC03-12A10-3AM10.5 (3-pin male plug)

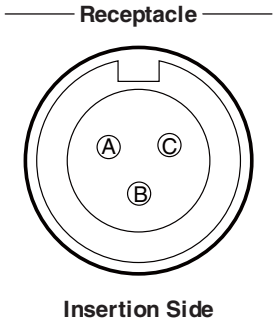
Pin No.	Name	Function	I/O	External Interface
Ⓐ	NC	————————	—	
Ⓑ	+ 12V LAMP	DC + 12 V power supply output for lamp	OUT	
Ⓒ	+ 12V RET	Ground for DC + 12 V power supply for lamp	RET	

Caution:

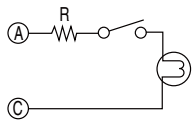
The above voltage is applicable only for SCRIP lamp. Do not use for any other purposes.
Considering the voltage applied to LAMP, use R (resistance) as necessary.

■ SCRIPT Connector (Camera rear view)

A connector used to supply the power to a script lamp.



Camera head side : PRC05-RB3F (Tajimi)
Cable side : PRC05-P3M (3-pin male plug)

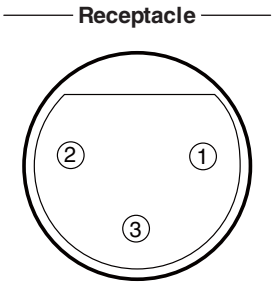
Pin No.	Name	Function	I/O	External Interface
Ⓐ	+ 12V LAMP	DC + 12 V power supply output for lamp	OUT	
Ⓑ	+ 12V RET	Ground for DC + 12 V power supply for lamp	RET	
Ⓒ	+ 12V RET	Ground for DC + 12 V power supply for lamp	RET	

Caution:

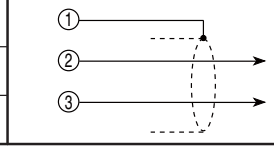
The above voltage is applicable only for SCRIP lamp. Do not use for any other purposes.
Considering the voltage applied to LAMP, use R (resistance) as necessary.

■ *TRUNK OUT Connector*

A connector used to output one of the audio signals: PGM-1, PGM-2, or PGM-3.



Camera head side : XLR-3-31-F77
Cable side : XLR-3-12C (3-pin male plug) or equivalent

Pin No.	Name	Function	I/O	External Interface
①	SHIELD	Ground for PGM audio signal output	GND	
②	PGM (H) OUT	PGM auto signal output (H)	OUT	
③	PGM (C) OUT	PGM auto signal output (C)	OUT	

7.4 Scene File

■ *Save condition of a HDK-790GX scene file*

Item	Save Data	SELF	CCU
			DTL CONT HEAD
GAIN	-6dB ～ +18dB	CAMERA	CAMERA
GAMMA	OFF/0.35/0.40/0.45	CAMERA	CAMERA
GAMMA TYPE	NORMAL、CINE1 ～ 2、CUSTOM1 ～ 5	CAMERA	CAMERA
FLARE	ON/OFF	CAMERA	CAMERA
KNEE	ON/OFF	CAMERA	CAMERA
AUTO KNEE	ON/OFF	CAMERA	CAMERA
WHITE CLIP	ON/OFF	CAMERA	CAMERA
DTL	ON/OFF	CAMERA	CAMERA
HARD DTL (SOFT DTL OFF)	ON/OFF	CAMERA	CAMERA
SKIN DTL	ON/OFF	CAMERA	CAMERA
MATRIX	OFF/MTX1 ～ 3	CAMERA	CAMERA
PRESET SHUTTER	OFF、1s ～ 1/2000	CAMERA	CAMERA
VARIABLE SHUTTER	ON/OFF	CAMERA	CAMERA
SUPER V	ON/OFF	CAMERA	CAMERA
BLACK STRECH	OFF/-11% ～ +11%	CAMERA	CAMERA
ND FILTER	ND1 ～ ND5	CAMERA	CAMERA
ECC FILTER	ECC A ～ ECC E	CAMERA	CAMERA
EFFECT FILTER	EFF Ⅰ～ EFF Ⅴ	CAMERA	CAMERA
COLOR SAT	ON/OFF	CAMERA	CAMERA
BLK Shade	ON/OFF	CAMERA	CAMERA
WHT Shade	ON/OFF	CAMERA	CAMERA
COLOR DTL	ON/OFF	CAMERA	CAMERA
COLOR CORRECT	ON/OFF	CAMERA	CAMERA
SUPER KNEE	OFF/LOW/MID/HIGH	CAMERA	CAMERA
HI-LIGHT DTL	ON/OFF	CAMERA	CAMERA
SMOOTH KNEE	OFF/TYPE1 ～ TYPE3	CAMERA	CAMERA
ZOOM DTL	ON/OFF	CAMERA	CAMERA
ZOOM SKIN DTL	ON/OFF	CAMERA	HEAD
VARIABLE C.TMEP	ON/OFF	CAMERA	CAMERA

CHANGING INFORMATION

This chapter contains the revision information of user-specific specification or design change requested by users or any changes done by Ikegami.
Read by comparing this information with the main part of the operation manual.

HDK-790GX

HIGH DEFINITION CAMERA SYSTEM
OPERATION MANUAL

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Ikegami

Ikegami Tsushinki Co., Ltd.

5-6-16, Ikegami, Ohta-ku, Tokyo, 146-8567, Japan
Phone : +81-(0)3-5700-4114 Fax : +81-(0)3-5748-2200
E-Mail : info_e@ikegami.co.jp
URL : http://www.ikegami.co.jp/en/

Ikegami Electronics (U.S.A.),Inc.

37 Brook Avenue, Maywood, New Jersey 07607, U.S.A.
Phone : +1-201-368-9171 Fax : +1-201-569-1626
E-Mail : engineering@ikegami.com, service@ikegami.com
URL : http://www.ikegami.com

Ikegami Electronics (Europe) GmbH

Ikegami Strasse 1, D-41460 Neuss, GERMANY
Phone : +49-(0)2131-123-0 Fax : +49-(0)2131-102820
E-Mail : info@ikegami.de
URL : http://www.ikegami.de

Ikegami Electronics (Europe) GmbH - UK

Unit E1, Cologne Court, Brooklands Close,
Sunbury-on-Thames, Middlesex, TW16 7EB, UK.
Phone : +44-(0)1932-76 97 00 Fax : +44-(0)1932-76 97 10
E-Mail : technical@ikegami.co.uk , sales@ikegami.co.uk

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