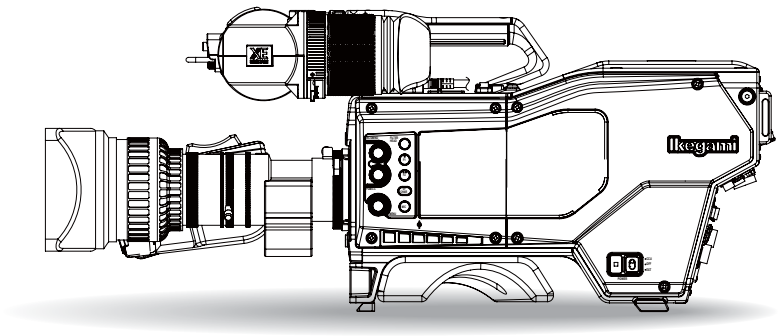
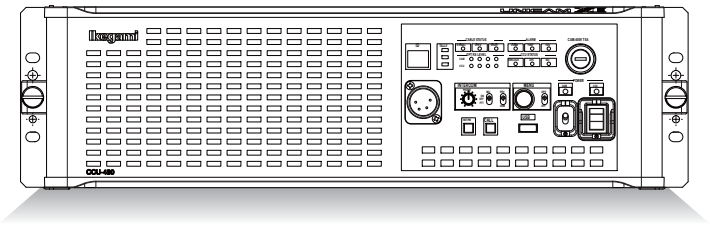
Products conforming to RoHS directive





UHK-430
CCU-430

4K/HD
Portable Camera System

OPERATION MANUAL

CE

Ikegami

UHK-430
CCU-430

4K/HD
Portable Camera System

OPERATION MANUAL

1710 Edition (E)

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.

- UHK-430	Color Camera
- CCU-430	Camera Control Unit
- SE-U430	System Expander
- VFE741D, VFL701D, VFL201D	Viewfinder
- OCP-300	Ethernet-Compatible Operation Control Panel
- MCP-300	Ethernet-Compatible 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.

* 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.

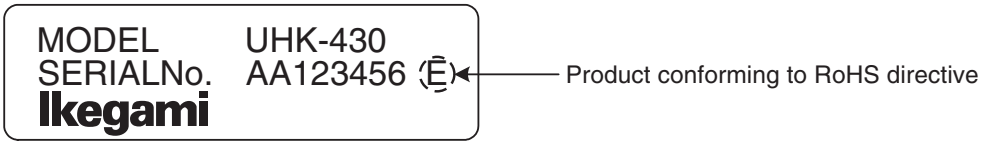
1. Mercury in compact fluorescent lamps not exceeding 5mg per lamp
2. Mercury in straight fluorescent lamps for general purposes not exceeding:
   - halophosphate 10mg
   - triphosphate with a normal lifetime 5mg
   - triphosphate with a long lifetime 8mg
3. Mercury in straight fluorescent lamps for 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

- The printed circuit boards of the RoHS compliant products have ether of the following marks with 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 and the Standards EN55032, EN-61000-3-2, EN6100-3-3, EN55103-2 E4-E5 (for EMC), EN62368-1 (for LVD).
   For European customer.

People's Republic of China Electronic Industry Standard (SJ/T11364—2006)

Marking Styles for Names and Contents of Toxic or hazardous Substances and Elements

Part Name	Toxic or hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (Cr/(VI))	Polybrominated biphenyls (PBB)	Polybrominated diphenyl ethers (PBDE)
UHK-430	×	○	○	○	○	○
CCU-430	×	○	○	○	○	○

○: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006.
×: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T11363-2006.

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, please pull an AC plug of the CCU side.

Regarding the power voltage supplied to CCU

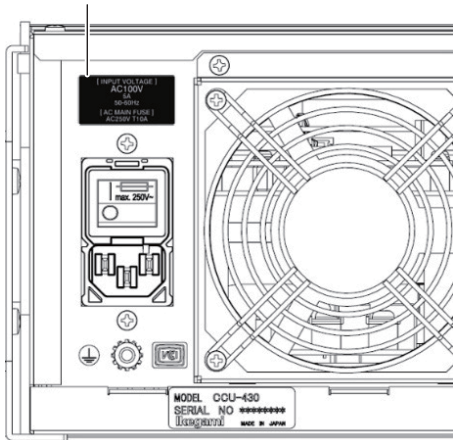
Although this product is factory set for the AC input voltage to match the standard voltage of the destination area, be sure to confirm the power supply voltage setting by the following procedure before energizing the CCU.

With the power supply voltage setting of the CCU at AC 100V~120V, inputting AC 220V~240V voltage to the CCU may cause serious damage.

Confirm the AC voltage of the power source to the CCU, measure the voltage if uncertain. The factory setting of the AC voltage is indicated on a label on the upper left corner of the CCU.
If the setting of the CCU matches the voltage of the power source, connection of the AC cable is okay.

Please refer to “4.3 Turning On the Power” for further instruction.

CCU input voltage setting



⚠ 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 optical block or other area of the camera.

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 CMOS sensors are element is adopted as the imagers sensor in picture elements, no burning occurs in ordinary operation. However, when shooting a subject which emits an excessive amount of light (Sun, laser light, etc.) for long hours, take great care for temperature increase inside of the sensors.

Laser beams may damage the sensors. 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 an 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 product (Camera and 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 Cable

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

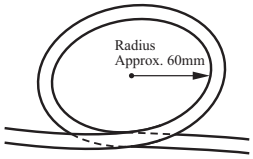
If the ferrule is dirty, wipe the dirt off with cotton swabs soaked in alcohol.

The fiber cable power supplies of AC230V 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 Camera Connector and the Fiber Cable

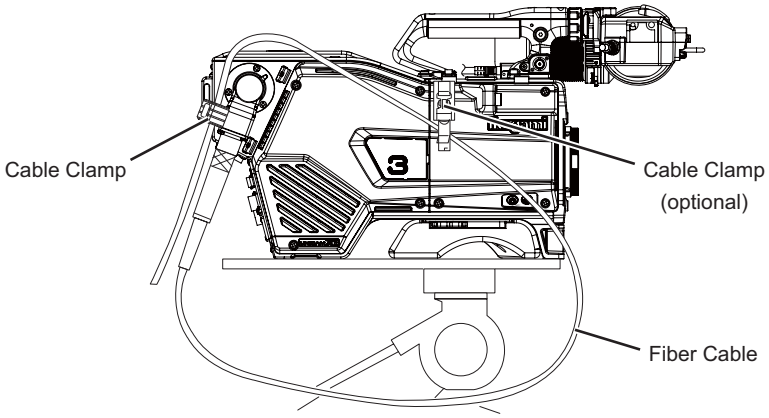
Take care for the following:

- When disconnecting the fiber 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 cable.
- The allowable radius of curvature of fiber 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 Cable

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



- The camera connector and fiber cable connector (plug) have a structure that is susceptible to dust, etc. Hence, if the camera is not in use, be sure to put the attached connector cover to prevent from the dust.

■ *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 UHK-430/CCU-430 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	Indicates UHK-430 and CCU-430.
Camera	Indicates UHK-430 Camera (UHK-430S Sensor Unit and UHK-430M Main Unit).
CCU	Indicate CCU-430 Camera Control Unit.
OCP	Basically indicates OCP-300 Operation Control Panel.
MCP	Basically indicates MCP-300 Maintenance Control Panel.
Fiber cable	Indicates fiber composite camera cable.
“ ” - “ ” - “ ”	Indicates the items enclosed by double quotes (“ ”) are to be selected and confirmed in the order shown.
4K	4K indicates the video outputs with active image area of 3840 x 2160 or 4096 x 2160. In this document, 4K indicates the 3840 x 2160 output.
HD (SDI)	Signals that comply with SMPTE 292 1.5Gb/s Signal/Data Serial Interface 1280×720, 1920 x 1080.
3G (SDI)	Signals that comply with SMPTE 424/425 3Gb/s Signal/Data Serial Interface 1920×1080 (Level-A/B).
Quad Link	A method to construct a 4K image with 4 links.

■ 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

- SE-U430 System Expander Instruction Manual
- OCP-300 Ethernet-Compatible Operation Control Panel Operation Manual
- MCP-300 Ethernet-Compatible Maintenance Control Panel Operation Manual
- VFL201D 2-inch LCD Color Viewfinder Operation Manual
- VFL701D 7-inch Full HD LCD Color Viewfinder Operation Manual
- VFE741D 7.4-inch OLED Color Viewfinder Operation Manual

Structure of Operation Manual

This manual is intended to help you operate the UHK-430/CCU-430 safely and smoothly. This manual consists of seven chapters. We recommend you read them in sequence from Chapter 1 to Chapter 9 so that you can carry out all the work smoothly through the installation to the operation of the camera equipment.
This system camera is consisted of a Camera and CCU (Camera Control Unit), making it suitable for various operations in studio and field environments.

Chapter 1

OUTLINE

Explains the features and the main operating systems of this product.
If you are not familiar with UHK-430 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.
Taking examples of studio and field shooting, explains how to connect this product to the peripheral equipment.

Chapter 4

OPERATION

Explains the setup required 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 the settings using switches of camera and settings through the menu screen.

Chapter 6

CCU SETTINGS and ADJUSTMENT

This chapter explains the settings using switches of CCU and settings through the system menu screen.

Chapter 7

Helpful Technical Information

This chapter provides technical information that is helpful for using this product.

Chapter 8

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 9

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.)

UHK-430/CCU-430

4K/HD
Portable Camera System
OPERATION MANUAL

Chapter 5. CAMERA SETTINGS and ADJUSTMENT

Chapter 6. CCU SETTINGS and ADJUSTMENT

Chapter 7. Helpful Technical Information

Chapter 8. TROUBLE SHOOTING and MAINTENANCE

Chapter 9. SPECIFICATIONS

1

OUTLINE

1.1 Overview of UHK-430/CCU-430

The UHK-430 employs a 3-chip optical system using 2/3-inch 4K CMOS for the imaging sensor. It provides a smooth shooting experience with the focus range and the depth of field that production people have been used in the broadcasting industry.
CCU-430 is Camera Control Unit (CCU) that connects the camera and optical composite fiber cables (two single mode fibers, two power lines, two control lines) to supply power and transmit and receive video, audio, and control signals.
It has a structure in anticipation of function extension in the future; the construction and operation of flexible system are possible on the basis of the transient period from HD to 4K.

CAUTION:
The functionality of this document includes items and contents that are available in combination with options.

1.2 Features of This Product

System Versatility

■ *Uncompressed 40 Gbps optical transmission between the Camera and CCU*

40 Gbps optical transmission system is employed. This system transmits HD and 4K video, audio, and data between the Camera and CCU without compression.

■ *Various TRUNK lines with high capacity transmission are included as standard.*

A bi-directional HD-SDI trunk video line from head to CCU is standard equipment. Moreover, the trunk video (HD-QTV) from the CCU to the Camera also corresponds to asynchronous videos and asynchronous embedded audio (4 ch).

■ *Multi return video input*

For the RET video input, four channels are possible with 3G/HD-SDI automatic recognition. Each channel is equipped with the frame synchronizer function; therefore, each channel supports asynchronous signals.
A two-channel ACTIVE-THROUGH function is provided. Switching between the ACTIVE-THROUGH function and the four-channel input function is possible by CCU menu selection.

■ *Audio Signal Embedded in each SDI Output (Embedded Audio Function)*

Audio signals can be embedded in SDI signals of the main output.

■ *Remote Control to Support Network*

In addition to the conventional Ikegami serial command (ICCP), controls by the Ethernet connection is also available.
By setting up an Ethernet system, a wide variety of operational configurations including panel assignments become possible. In addition, it is also compatible with systems corresponding to Ethernet, which allows wide expandability.

Superb Operation and Ease of Use

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

As the BTA S-1005B lens mount is used. Production of 4K/HD image is possible with the same depth of field as the conventional 2/3 HD camera and by maintaining the same levels of handleability and operability.

■ *Quietness*

With an NC value of 20 or less in indoor conditions, you do not need to worry about noise in TV studios, concert halls, etc.

■ *Focus assist function*

Focus assist area is provided in the VF video to allow the cameraman to find critical focus. The focus assist area can be displayed with auto triggering by focus operation or manual triggering by VTR switch operation on the lens or lens controller.

■ *Low center of gravity, light weight, and well-balanced design*

The low center of gravity, light weight, and well-balanced design provides perfect balance when shooting on the shoulder, as well as, easy to hold at various angles.

■ *Self diagnosis function*

Self diagnosis function allows monitoring the statuses of circuits for video, control, optical fiber transmission, synchronization signals, power supply. The statuses of camera can be always checked.

■ *Rotating Camera Connector*

The camera employs a rotating camera connector. This enables studio and field shooting at various angles.

■ *Return Button*

RET-1/RET-2 selector button is also equipped on the camera handle. So, it is easy to operate the Return switch when shooting from a low angle.

Employment of New Technology

■ *Newly developed 4K CMOS sensor and video processor*

2/3 inch 8 Megapixel 4K CMOS sensor and video processor LSI are newly introduced to output high quality and high-definition Real 4K videos.

■ *Digital I/F and two-way communication with viewfinder (VF)*

Since the control communication between the camera and the VF is accomplished by two-way RS-485 communication, the MENU of the camera can be operated from VF, and the MENU of VF can be operated from the camera.

Other Features

■ *Gigabit Ethernet Trunk Line*

An Ethernet Trunk (1000BASE-T) is available as a data trunk line between the Camera and CCU.

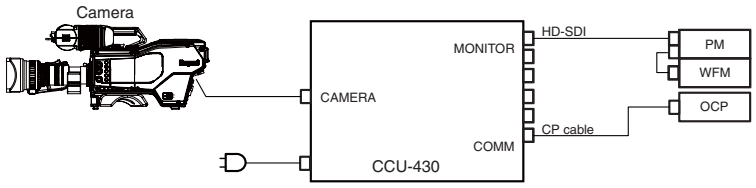
■ *Independent 4K/HD video processing*

Newly developed ASIC was employed and the simultaneous operation of HD and 4K (optional) has become possible.

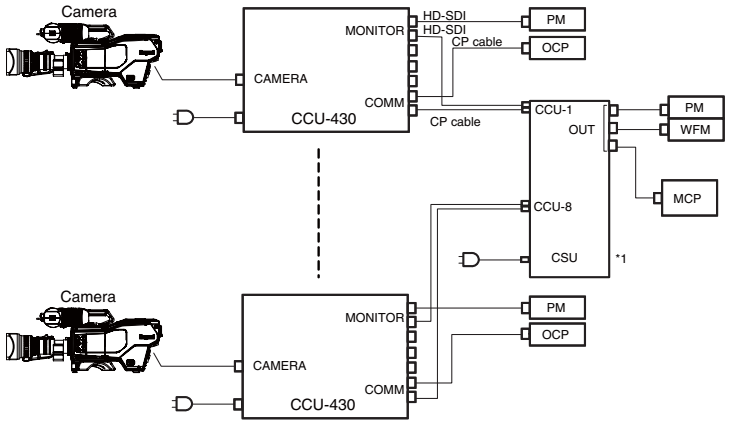
1.3 Operating Systems

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 SE-U430 System Extender.
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)*



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



Note:

- By combining the Camera with SE-U430 system expander (option), it can be mounted as a full-scale studio camera with 7 or 7.4-inch viewfinder and full studio lens

Note:

For Minimum operating System, no MCP needed when OCP-300 is used.
If the MCP-300 is used, EXTERNAL POWER is required. Please refer to the operation manual of MCP-300 for the specifications of the external power supply.

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.

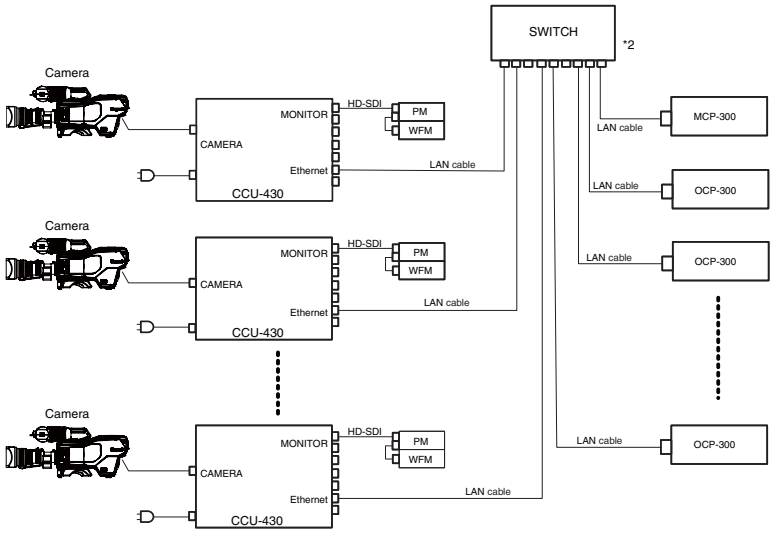
Term:

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.

Caution:

*1 HD-SDI option must be installed to monitor using CSU.

■ *Ethernet Connection (Expanded connection)*



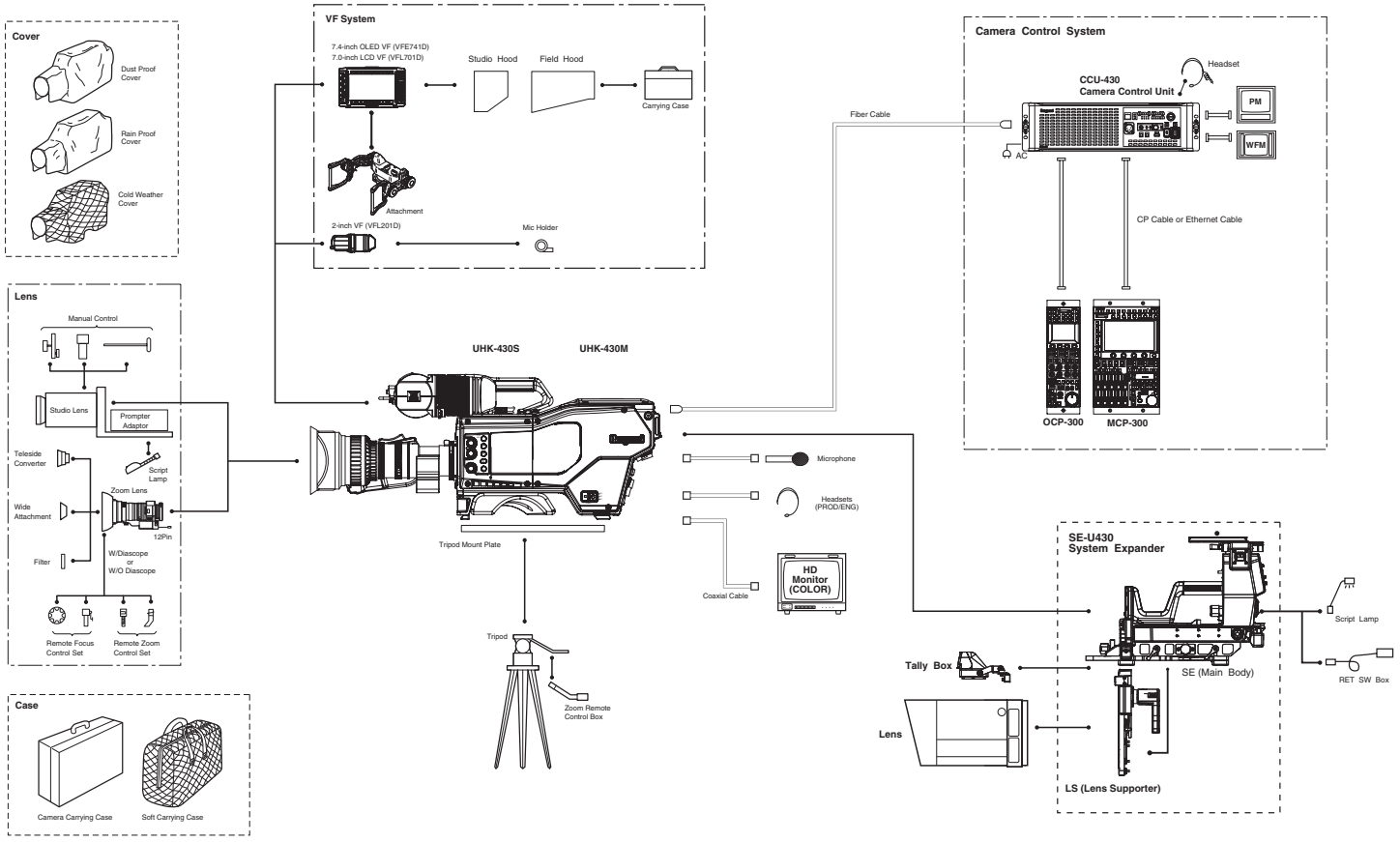
Term:

PoE (Power over Ethernet)
PoE is the technology to supply power with LAN cable.

Caution:

*2- When OCP is compatible with PoE+ (IEEE 802.3at), the PoE function can be used in this connection.

1.4 Connection Diagram



2

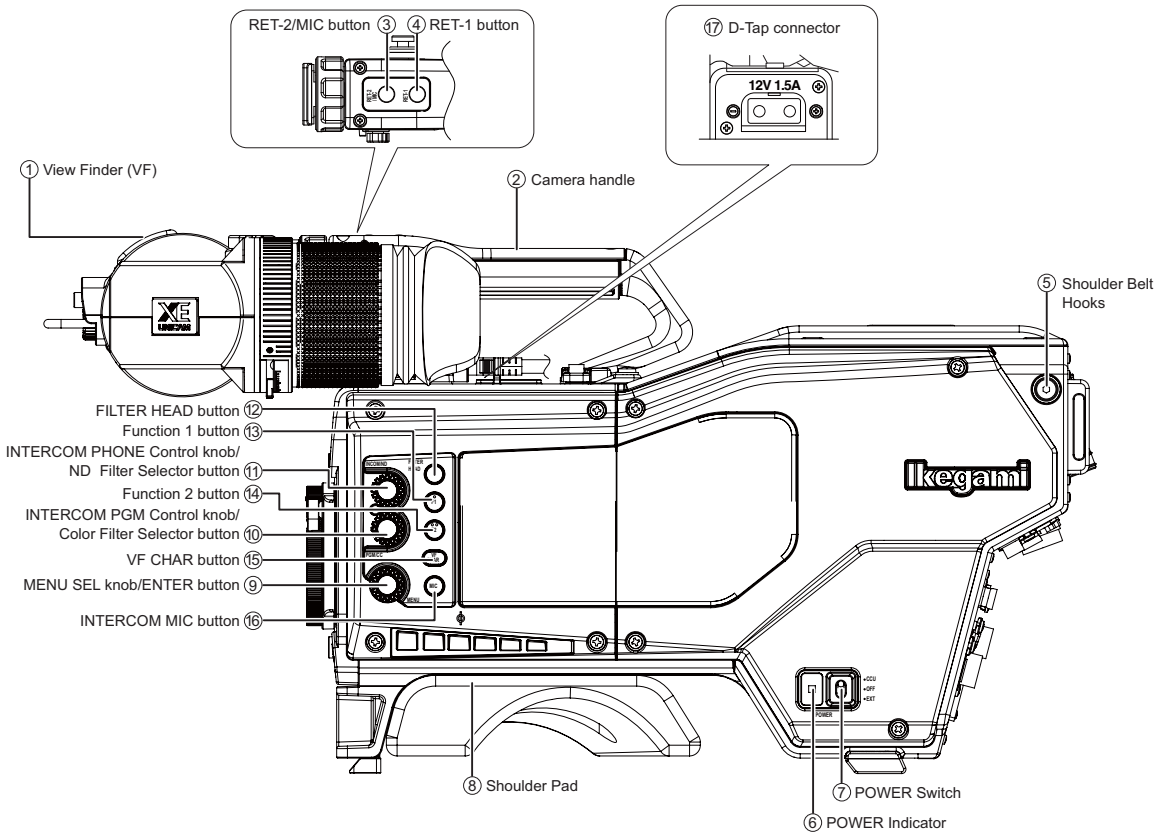
NAME and FUNCTION

2.1 Camera and Viewfinder

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

Name and Function of the Camera Right Side

■ *Name of the camera right side*



■ *Function of the camera right side*

(1) View Finder (VF)
Displays videos from the camera, return videos, and various characters and markers on the viewfinder screen. 2-inch portable color viewfinder, 7-inch studio color viewfinder, and 7.4-inch OLED studio color viewfinder are available.

(2) Camera handle
Hold this handle to carry the camera.

(3) RET-2/MIC button
Assign the RET-2/MIC button to either of these functions so that you can turn the function on/off with your hand on the handle.

● When set to RET-2
RET-2 video is displayed in the viewfinder only while this button is pressed. When this button is not pressed, the video from the camera is displayed.

● When set to MIC
This button is used to turn on the intercom microphone of the headset plugged into the camera. While this button is pressed, the microphone input is turned on.

Reference:
The assignment of functions is set on the menu screen. Please refer to **"Chapter 5 : CAMERA SETTINGS and ADJUSTMENT" "5.3 Menu Configuration and content" (P. 86)** for setting methods.

(4) RET-1 button
RET-1 video is displayed in the viewfinder only while this button is pressed. When this button is not pressed, the video from the camera is displayed.

(5) Shoulder Belt Hooks
Hooks to be used to attach a shoulder belt (option).

Reference:
Please refer to **"Chapter 3 : INSTALLATION AND CONNECTION" "3.3 Camera and Peripheral Installation and Connection" "Attaching a Shoulder Belt" (P. 50)** for more information.

(6) POWER Indicator
Displays the status of power to the camera
Green light : Power is supplied.
Red light : Stand by status

(7) POWER Switch
This switch is used to turn on/off the camera and select power sources.
CCU : Power is supplied from the CCU via the camera.
OFF : Power is turned off.
EXT : Power is supplied from an external power source. Select this to supply power via the DC IN connector.

Caution:
If you turn on the power and turned it on again, wait for 5 seconds before turning on.

(8) Shoulder Pad
Place this on your shoulder when carrying the camera.

(9) MENU SEL knob/ENTER button
Turn the knob to select the operation you wish to use from the menu items displayed on the VF screen, and press this button to select. The contents of the menu and setting methods are explained in **"Chapter 5 : CAMERA SETTINGS and ADJUSTMENT"**.

(10) INTERCOM PGM Control knob/Color Filter Selector button
This control is used to adjust the PGM volume of the intercom system when "ENG" or "PROD" is selected using the INTERCOM FRONT VR selector switch on the back of the camera. Press the FILTER HEAD button on the right side of the camera, and use the color filter to switch the color temperature while the operation right is on the camera side. Please refer to **"Chapter 5 : CAMERA SETTINGS and ADJUSTMENT" "Controlling the ND Filter and Color Filter" (P. 125)** for more information.

(11) INTERCOM PHONE Control knob/ND Filter Selector button

This control is used to adjust the intercom receiver volume when "ENG" or "PROD" is selected using the INTERCOM FRONT VR selector switch on the back of the camera. Press the FILTER HEAD button on the right side of the camera, and use the ND filter to switch the transmittance while the operation right is on the camera side. Please refer to **"Chapter 5 CAMERA SETTINGS and ADJUSTMENT" "Controlling the ND Filter and Color Filter" (P. 125)** for more information.

(12) FILTER HEAD button

This switch allows selecting the color filter and ND/effect filter at the camera.

(13) Function 1 (F1) button

Select one of the items prepared using the VF menu, and assign it to Function 1 button.
Please refer to **"Chapter 5 CAMERA SETTINGS and ADJUSTMENT" "FUNCTION SW" (P. 100)** for setting items and setting method.

(14) Function 2 (F2) button

Select one of the items prepared using the VF menu, and assign it to Function 1 button.
Please refer to **"Chapter 5 CAMERA SETTINGS and ADJUSTMENT" "FUNCTION SW" (P. 100)** for setting items and setting method.

(15) VF CHAR button

The character display on the VF screen displays information (characters) used to confirm the status of various controls of the camera. Pressing the VF CHAR switch will call up the full character display on the viewfinder screen. This switch is also used to call up the camera menu.

(16) INTERCOM MIC button

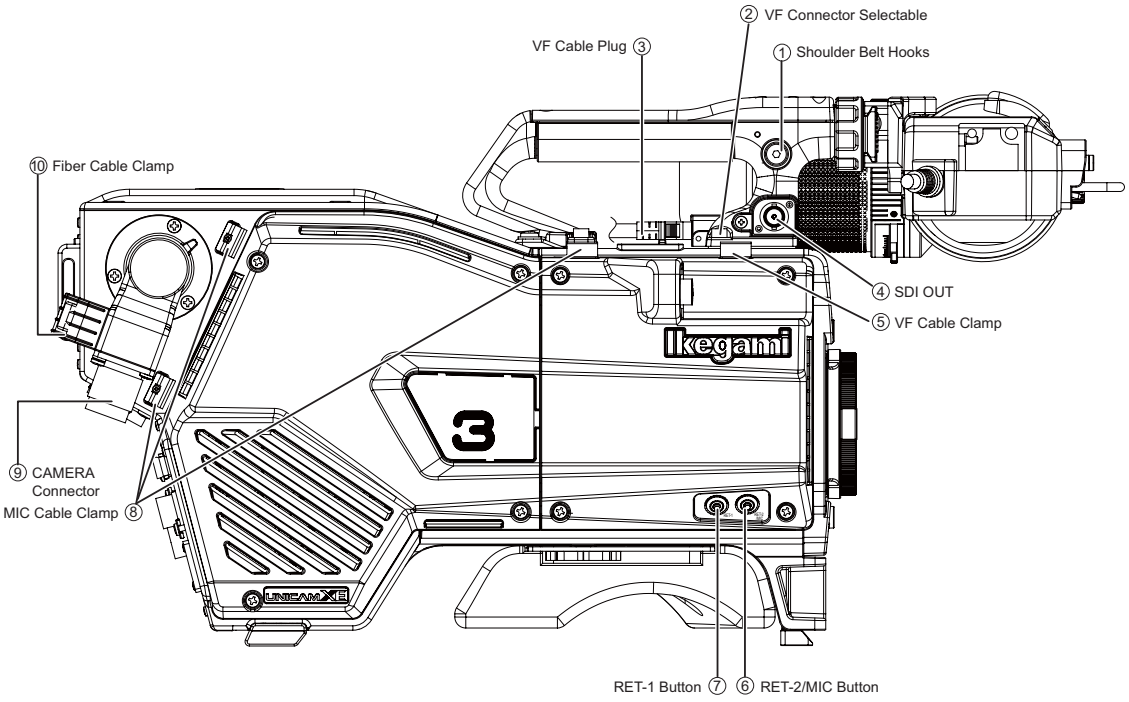
The INTERCOM MIC button is used to select ON/OFF of headset microphone (linked to INTERCOM selector switch) connected to the camera.

(17) D-Tap connector

A power output connector (DC +12V 1.5A) that supplies power to external compact monitors, etc.

Name and Function of the Camera Left Side

■ *Name of the Camera left side*



■ *Function of the camera left side*

(1) Shoulder Belt Hooks

Hooks to be used to attach a shoulder belt (option).
Please refer to "Attaching the Shoulder Belt" in Chapter 3.

Reference:

Please refer to **"Chapter 3 : INSTALLATION and CONNECTION" "3.3 Camera and Peripheral Installation and Connection" "Attaching a Shoulder Belt" (P. 50)** for more information.

(2) VF Connector

Used to connect a VF cable.

(3) VF Cable Plug

A connector attached to a cable from VF. The latches on both sides are for locking the connector in place. To remove the VF connector, press in on both latches and then remove it.

(4) SDI OUT

Outputs the same video signal as the SDI OUT 3 connector.

(5) VF Cable Clamp

A clamp used to fix the VF cable.

(6) RET-2/MIC Button

Assign the RET-2 selector function or the INTERCOM MIC switch function to this button so that you can control the assigned function at the side of the camera.

- When set to RET-2
  The video of view finder is switched from the video of the camera to the RET-2 video while this button is pressed.
- This button is used to turn on the microphone of intercom when "ENG" or "PROD" is selected using the INTERCOM FRONT VR selector switch on the back of the camera.
  While this button is pressed, the intercom microphone is turned on.

(7) RET-1 Button

This button is used to switch the video of view finder from the video of the camera to the RET-1 video. The video of view finder is switched to the RET-1 video while this button is pressed.

Reference:

The assignment of functions for RET-1 and RET-2/MIC buttons is set on the Menu screen. Please refer to **"Chapter 5 CAMERA SETTINGS and ADJUSTMENT" "5.3 Menu Configuration and content" (P. 86)** for the setting methods.

(8) MIC Cable Clamp

A clamp used to fix a cable for a microphone.

(9) CAMERA Connector

A connector used to connect the Camera and CCU with a fiber camera cable.

Reference:

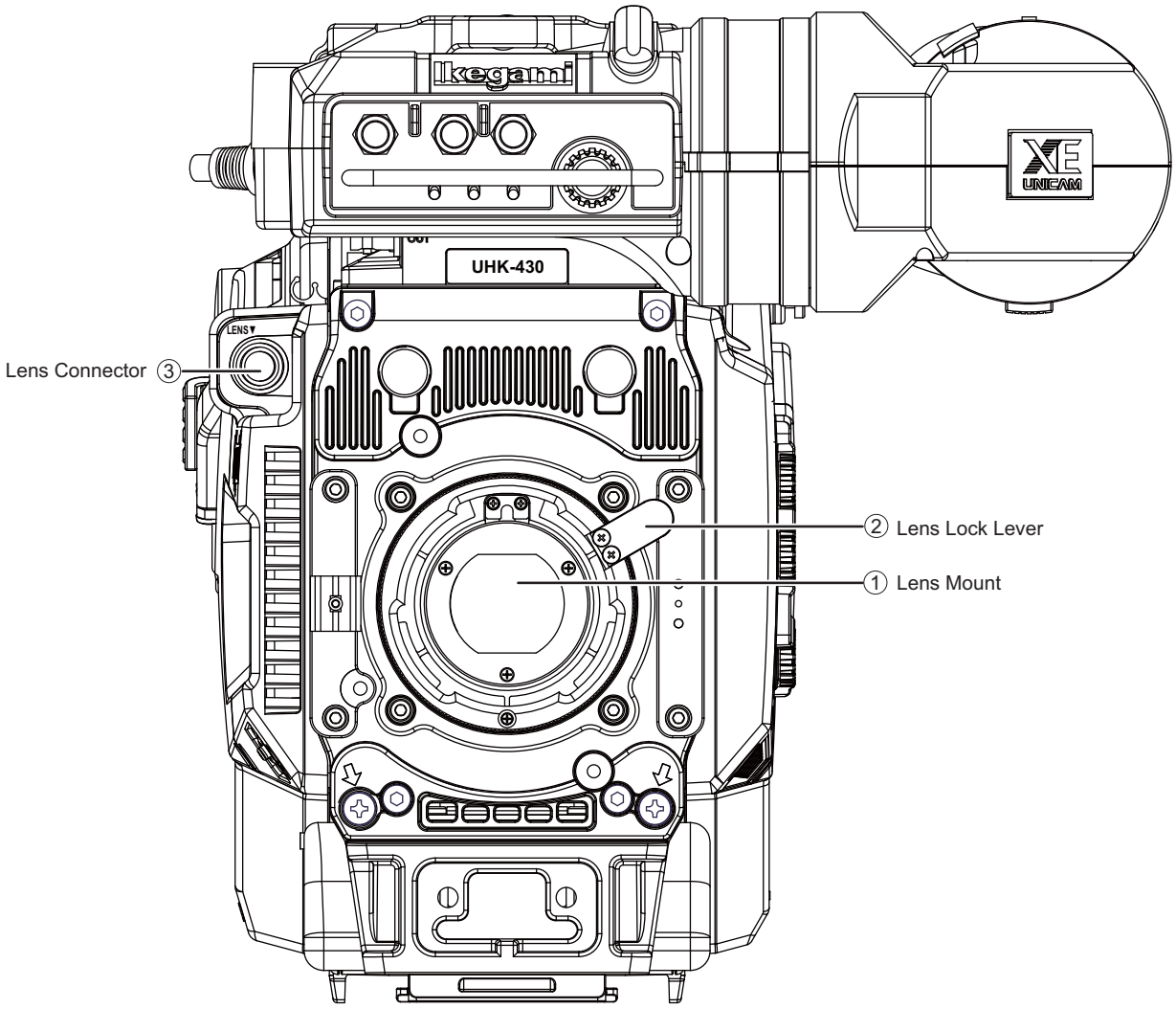
See **"SAFETY PRECAUTIONS" "Regarding the Camera Connector and the Fiber Optic Cable"** for the routing and fixing methods of fiber cables.

(10) CAMERA Cable Clamp

A clamp used to fix a fiber camera cable (Ø 9.2).

Name and Function of the Camera Front Side

■ *Name of the camera front side*



■ *Function of the camera front side*

(1) Lens Mount

Various 2/3-inch broadcast lenses can be used. The lens mount is compatible with the BTA-105 spec.

(2) Lens Lock Lever

A lever used to lock the lens mount. Insert the lens, and then turn and fix the lens mount ring with the lever.

(3) Lens Connector

A connector used to connect a lens cable (12-pin). It is compatible with BTA spec.

Reference:

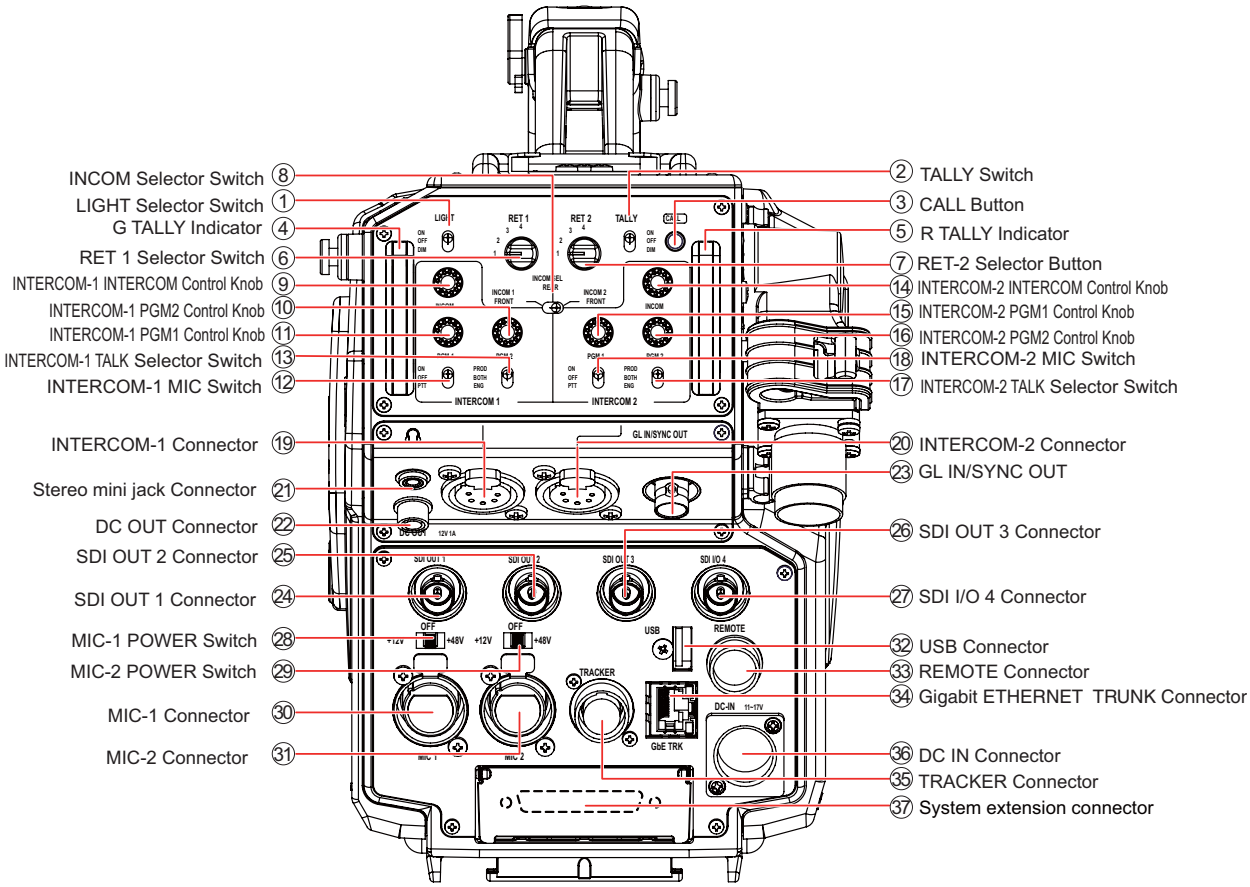
Please refer to **"Chapter 9 : SPECIFICATIONS" (P. 211)** for pin functions of the lens connector.

Reference:

Please refer to **"Chapter 5 : CAMERA SETTINGS and ADJUSTMENT" "5.2 Basic Operation of the Menu" (P. 81)** for the main screen display.

Name and Function of the Camera Rear Side

■ *Name of the Camera rear side*



■ *Function of the Camera rear side*

(1) LIGHT Selector Switch

ON/OFF switch for rear illumination .

ON : Lighting is turned on.
DIM : Lighting is turned on with reduced brightness.
OFF : Lighting is turned off.

(2) TALLY Selector Switch

ACT : TALLY display is activated.
OFF : TALLY display is deactivated (forced light off)

(3) CALL Button

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

(4) G TALLY indicator

Lights up when the G TALLY signal is inputted to TALLY IN connector on the back side of CCU.

(5) R TALLY indicator

Lights up when the R TALLY signal is inputted to TALLY IN connector on the back side of CCU. Also lights up while the CALL buttons of the camera or control panels (OCP, MCP, RCP, etc.) are pressed.

(6) RET-1 Selector Switch

A switch used to select one of four return video signals connected to the CCU as RET-1 video.

(7) RET-2 Selector Switch
A switch used to select one of four return video signals connected to the CCU as RET-2 video.

(8) INTERCOM Selector Switch
A switch used to select whether to use the side control panel (INTERCOM PGM control knob, INTERCOM PHONE control knob) of the Camera or controls on the back of the camera to adjust the volume of intercom.

INTERCOM-1 : Adjust the volume for INTERCOM-1 using the control panel on the side of the camera. The volume adjustment for INTERCOM-2 is performed using the controls on the back of the camera.
OFF : All volume adjustment is done at the rear control panel.
INTERCOM-2 : Adjust the volume for INTERCOM-2 using the control panel on the side of the camera. The volume adjustment for INTERCOM-1 is performed using the controls on the back of the camera.

(9) INTERCOM-1 INTERCOM Control Knob
A control to adjust the volume of intercom receiver for INTERCOM-1.

(10) INTERCOM-1 PGM2 Control Knob
A control to adjust the volume of PGM2 of intercom system for INTERCOM-1.

(11) INTERCOM-1 PGM1 Control Knob
A control to adjust the volume of PGM1 of intercom system for INTERCOM-1.

(12) INTERCOM-1 MIC Switch
ON/OFF switch of the intercom microphone for the INTERCOM-1 headset.

ON : Turns ON the intercom microphone.
OFF : Turns OFF the intercom microphone.
PTT : Turns ON the intercom microphone while this switch is pressed.

(13) INTERCOM-1 TALK Selector Switch
A switch used to select the TALK channel of INTERCOM-1.

PROD : Production channel.
BOTH : Production & Engineering channels.
ENG : Engineering channel.

(14) INTERCOM-2 Control Knob
A control to adjust the volume of intercom receiver for INTERCOM-2.

(15) INTERCOM-2 PGM1 Control Knob
A control to adjust the volume of PGM1 of intercom system for INTERCOM-2.

(16) INTERCOM-2 PGM2 Control Knob
A control to adjust the volume of PGM2 of intercom system for INTERCOM-2.

(17) INTERCOM-2 TALK Selector Switch
A switch used to select the TALK channel of INTERCOM-2.

PROD : Production channel.
BOTH : Production & Engineering channels.
ENG : Engineering channel.

(18) INTERCOM-2 MIC Switch
ON/OFF switch of the intercom microphone for the INTERCOM-2 headset .

ON : Turns ON the intercom microphone.
OFF : Turns OFF the intercom microphone.
PTT : Turns ON the intercom microphone while this switch is pressed.

(19) INTERCOM-1 Connector
A connector used to connect a headset for INTERCOM-1.

(20) INTERCOM-2 Connector
A connector used to connect headsets of intercom system for INTERCOM-2.

(21) Stereo mini jack Connector (EARPHONE Jack)
A jack used to connect a headset with mini plug specifications. It is possible to listen to intercom and PGM channels.

(22) DC OUT Connector
A DC 12V (1.0A) output connector for general purpose.

(23) GL INPUT/SYNC OUT connector
In self-contained operation, a GENLOCK (synchronous coupling) signal can be input to synchronize the camera.
In CCU operation, a synchronization signal is output for other cameras, monitors, etc.

(24) SDI OUT 1 Connector
A connector used to output an HD-SDI signal to an external system. Used to output video signals of MON, VF, RET-1 to 4, and HD QTV-1 to 2.

(25) SDI OUT 2 Connector
A connector used to output an HD-SDI signal to an external system. Used to output video signals of MON, VF, RET-1 to 4, and HD QTV-1 to 2.

(26) SDI OUT 3 Connector
A connector used to output an HD-SDI signal to an external system. Used to output video signals of MON, VF, RET-1 to 4, and HD QTV-1 to 2.

(27) SDI I/O 4 Connector
A connector used to input or output the an HD-SDI signal. Used to output video signals of MON, VF, RET-1 to 4, and HD QTV-1 to 2.

Note:

The video trunk (HD TRUNK) channel from the camera to CCU is compatible with synchronized. Embedded audio (4ch) but not compatible with asynchronized Embedded audio (4ch).

(28) MIC-1 POWER Switch
A switch to change the power supply for the microphone that is connected to the MIC-1 connectors.
Select it depending on the type of microphone to be used.

+12V : Supplies power to the microphone for +12V AB power.
OFF : Does not supply power to the microphone. If the microphone does not require power supply, use it in this position.
+48V : Supplies +48 V phantom power to the microphone.

(29) MIC-2 POWER Switch
A switch to change the power supply for the microphone that is connected to the MIC-2 connectors.
Select it depending on the type of microphone to be used.

+12V : Supplies power to the microphone for +12V AB power.
OFF : Does not supply power to the microphone. If the microphone does not require power supply, use it in this position.
+48V : Supplies +48 V phantom power to the microphone.

(30) MIC-1 connector
A connector used to connect a microphone and input an audio signal for line output at the CCU .

(31) MIC-2 connector
A connector used to connect a microphone and input an audio signal for line output at the CCU.

(32) USB connector
Used to backup settings data for the camera using a USB memory to upgrade (install) the firmware version.

(33) REMOTE connector
A connector used to connect various remote control panels (OCP, MCP).

(34) Gigabit ETHERNET TRUNK connector
An Ethernet communication line between CCU and Camera. Various network devices can be connected for use. This line operates independently from video and control of the camera.

(35) TRACKER connector
Used for the external interface of the Intercom and Tally.

(36) DC IN connector
A connector used to connect POWER and supply +12V DC power to the camera.

(37) System extension connector
Contains a connector that connects the SYSTEM EXPANDER (SE-U430) and the camera.

Reference:

Refer to Chapter 9 for connector pin out information.

Name and Function of the Viewfinder

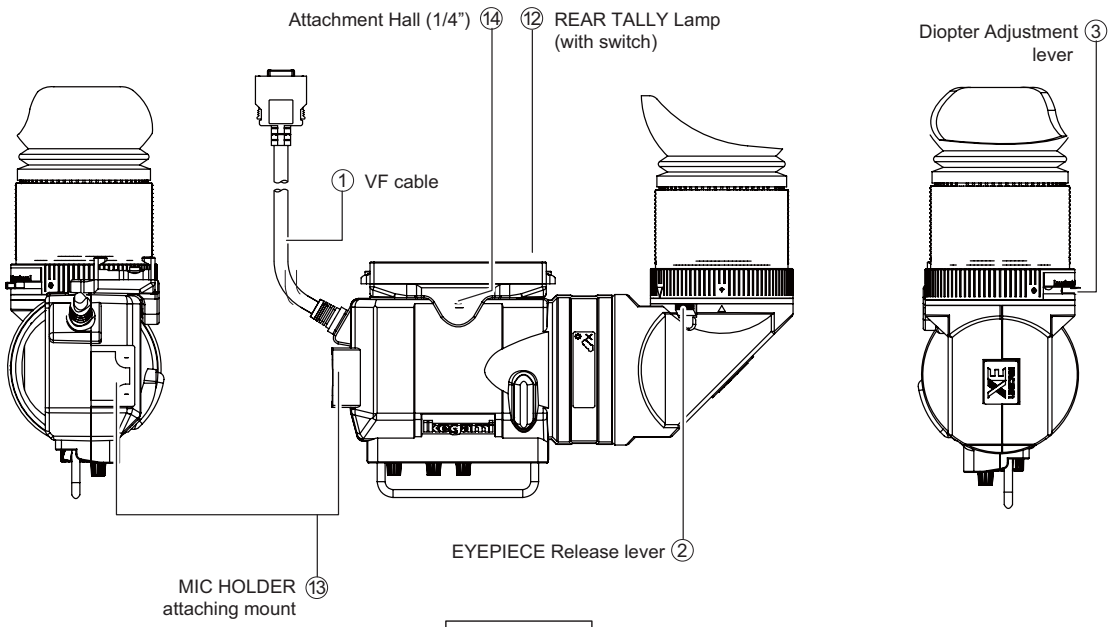
This document provides a description concerning the VFL201D. Please refer to the operation manual of each device for more details on the VFL201D, VFL701D, and VFE741D.

■ *VFL201D View*

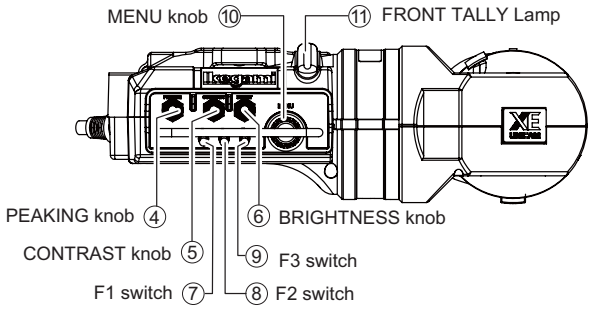
Left View

Top View

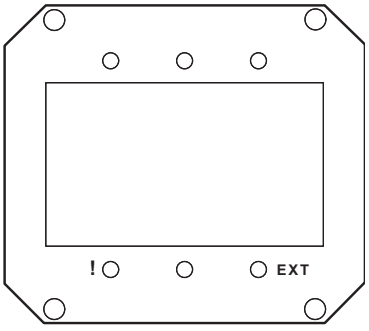
Right View



Front View



Bezel display



■ *Function of the VFL201D*

(1) VF cable
A cable used to connect the viewfinder to the camera.

(2) Eyepiece release lever
A lever used to remove the eyepiece to clean inside the viewfinder.

(3) Diopter adjustment lever
A lever used to adjust the focus of the viewfinder. It is adjusted according to the cameraman's eyesight so that video quality of the viewfinder is clear.

(4) Peaking knob
A knob used to enhance the sharpness of the viewfinder screen. Adjusts the level of outline enhancement so that you can bring the camera into focus. This is not reflected on the output signals of the camera.

(5) Contrast knob
A knob used to adjust the image contrast of viewfinder screen.
This is not reflected on the output signals of the camera.

(6) Brightness knob
A knob used to adjust the image brightness of the viewfinder screen.
This is not reflected on the output signals of the camera.

(7) F1 (Function 1) switch
This switch can be assigned to a frequently-used function among various viewfinder functions.
The assignable items include ON/OFF functions for Marker, ZEBRA, Zoom indicators, etc. using the Menu.

(8) F2 (Function 2) switch
This switch can be assigned to a frequently-used function among various viewfinder functions.
The assignable items include ON/OFF functions for Marker, ZEBRA, Zoom indicators, etc. using the Menu.

(9) F3 (Function 3) switch
This switch can be assigned to a frequently-used function among various viewfinder functions.
The assignable items include ON/OFF functions for Marker, ZEBRA, Zoom indicators, etc. using the Menu.

(10) Menu knob (with switch)
The menu control provides navigation of the camera menu.

(11) FRONT TALLY lamp
Lights up when the R TALLY signal is input to the CCU. It does not light up when the TALLY switch is set to OFF.

(12) REAR TALLY Lamp (with switch)
The REAR TALLY lamp is interlocked with the R TALLY indicator of the viewfinder, and lights during recording with the recorder or when R TALLY is input to various expansion devices. Since the REAR TALLY lamp serves as the switch, it can be turned ON/OFF by sliding.

(13) MIC HOLDER attaching mount
Attaches an external microphone holder.

(14) Attachment Hall (1/4'')
For attaching external attachment.

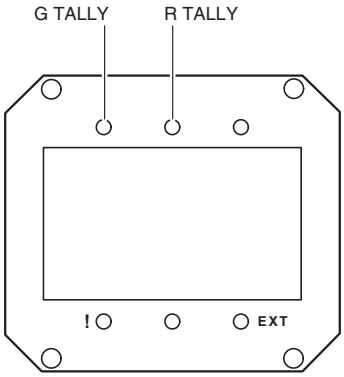
2.2 Displays in the Viewfinder (VFL201D)

In addition to the LED indicators on the viewfinder, markers and characters are also displayed on the viewfinder screen. Details are provided below. Please refer to Viewfinder details operation manual for differences with the studio viewfinders.

LED Indicator

G TALLY : An indicator for GREEN TALLY.
- R TALLY : An indicator for RED TALLY.
- EXT : Lights up when the lens extender is engaged.
- ! : Lights up when a camera setting is different from the standard setting value.

Setting item	Setting value
AWB selector switch	OFF
KNEE MODE	MANUAL
SKIN DTL	ON
SHUTT/SUP-V	ON
Backlight correction for auto-iris mode.	Other than OFF

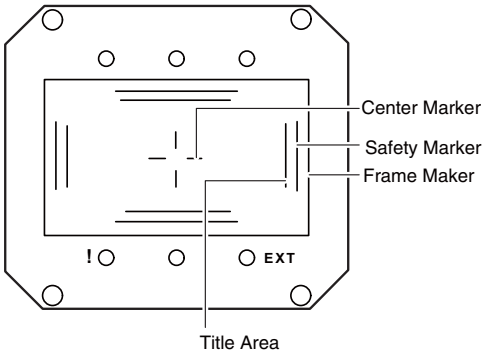


Center Marker, Safety Marker, Frame Marker

- The Center Marker is used to ascertain the center of the screen or align the camera horizontally and vertically. The center marker is selected from three types of shapes on the Menu screen.
- 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:

Please refer to **"Chapter 5 : CAMERA SETTINGS and ADJUSTMENT" "5.3 Menu Configuration and content" "MARKER CHRACTER(MARKER CHAR)" (P. 87)** for the setting method of each marker.

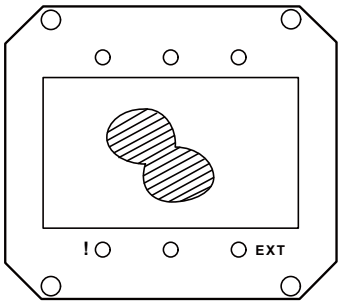


ZEBRA Indicator

Zebra Pattern means an stripe pattern displayed over the video. There are two types of Zebra signals: The first Zebra signal displays the part where the video level of the subject exceeds the setting value, and the second Zebra signal displays the part where the video level matches with the setting value. The ZEBRA indicator can be turned on/off when assigned to a Function switch on front side of viewfinder.

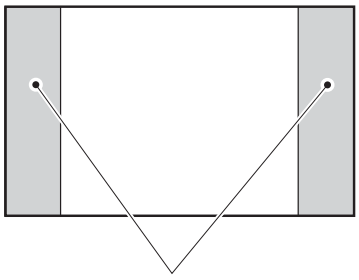
Reference:

Please refer to **"Chapter 5 : CAMERA SETTINGS and ADJUSTMENT" "5.3 Menu Configuration and content" "TALLY/INDICATOR" (P. 104)** for the setting method of zebra signal.



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



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

Reference:

See **"Chapter 5 : CAMERA SETTINGS and ADJUSTMENT" "5.3 Menu Configuration and content" "MARKER CHRACTER(MARKER CHAR)" (P. 87)** for how to set the side mask.

Display Mode

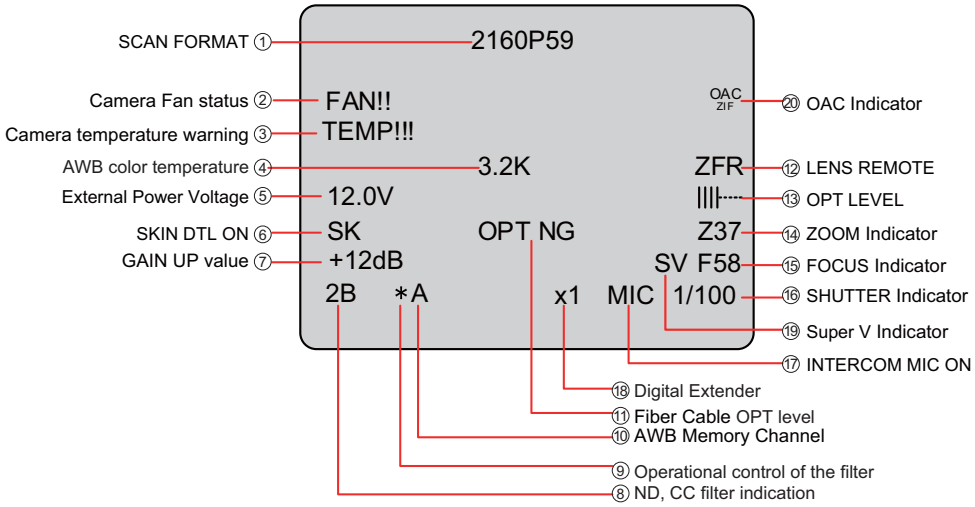
The display mode sets the markers and characters to be displayed in the viewfinder.

Reference:

See **"Chapter 5 : CAMERA SETTINGS and ADJUSTMENT" "5.3 Menu Configuration and content" "MARKER CHRACTER(MARKER CHAR)" (P. 87)** for the display mode is set from the menu.

Viewfinder Display

■ *Status Display*



■ *Display in the Viewfinder Function*

(1) SCAN FORMAT

Displays the setting values for the operation format of the camera.

(2) Camera Fan Status

The fan status is displayed.

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

(3) Camera temperature warning

Displays when the temperature inside the Camera exceeds the recommended maximum.

(4) AWB color temperature

The AWB color temperature is also displayed when the AWB/ABB switch and FILTER switch is operated. 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.

(5) External power supply voltage
Displays the external power supply voltage when the external power supply voltage is used to operate the camera.

(6) SKIN DTL ON
“SK” is displayed when the SKIN DTL function is ON.

(7) GAIN UP value
Displays for 2 seconds when the increment of the step gain is switched.
The step position is one of the following: -3dB, 0dB, +3dB, +6dB, +9dB, +12dB.

(8) ND and CC filter numbers

ND	1	2	3	4	5
	CLEAR	1/4	1/8	1/16	1/64
CC	A	B	C	D	E
	3200 K	4300 K	6300 K	CROSS	OPTION

(9) Operational control of the filters
"*" displayed when the camera has operational right control the filters.

(10) 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).

(11) Fiber Cable OPT level
Displays "OPT NG" when the optical receiver level of the fiber cable is below the minimum level.

(12) LENS REMOTE
Displayed when the operation of the lens is remote controlled (at theOCP-300, etc.). The remote operation of the lens is acquired or released using the operation control panel.

(13) OPT level
Optical signal level of the fiber cable is displayed in bar graph form when the CCU is connected to the camera.

(14) ZOOM indicator
Displays the lens zoom position (0 to 100).

(15) FOCUS indicator
Displays the lens focus position (0 to 100).

(16) Shutter indicator
Displays the shutter speed value when the Shutter is turned on.

(17) INTERCOM MIC
Displays when the intercom microphone is set to "ON".

(18) Digital Extender
The magnification is displayed when the digital extender is ON.

(19) Super V Indicator
Appears for 2 seconds when the Super V is turned on. Also it is displayed while "VF CHAR" button is pressed.

(20) OAC Indicator
Displays when "OAC GUIDE MARK" is set to "ON" in the Menu setting ("VIDEO ADJUSTMENT" → "OPTICAL ABERRATION CORR.").

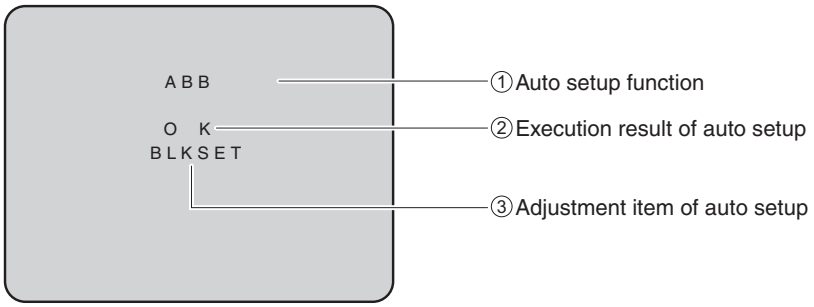
OAC : Displays for 2 seconds when the aberration correction value is properly received from the serial lens. The display continues to flash when either of ZIF is displayed. Also it is displayed while "VF CHAR" button is pressed.

OAC_Z : Flashes when the zoom position information of the lens is not linked normally. Please move the zoom.

OAC_I : Flashes when the iris position information of the lens is not linked normally. Please move the iris.

OAC_F : Flashes when the focus position information of the lens is not linked normally. Please move the focus.

■ *Auto Setup Display*



(1) Auto setup function

Executing auto setup function is displayed.
"AWB"
"ABB"
"FULL SETUP"
"LEVEL SETUP" etc.

(2) Execution result of auto setup

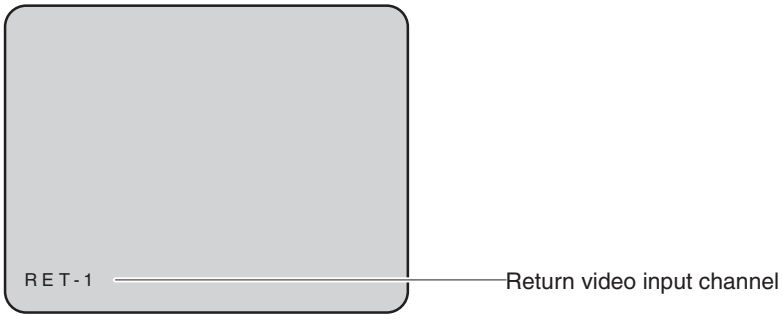
Execution result of auto setup (AWB and ABB, including) is displayed.

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.

(3) Adjustment item of auto setup

The item to which adjustment is being made is displayed during auto setup.
"FLARE GAMMA GAIN"
"PED"
"IRIS" etc.

■ *Return Video Channel Display*

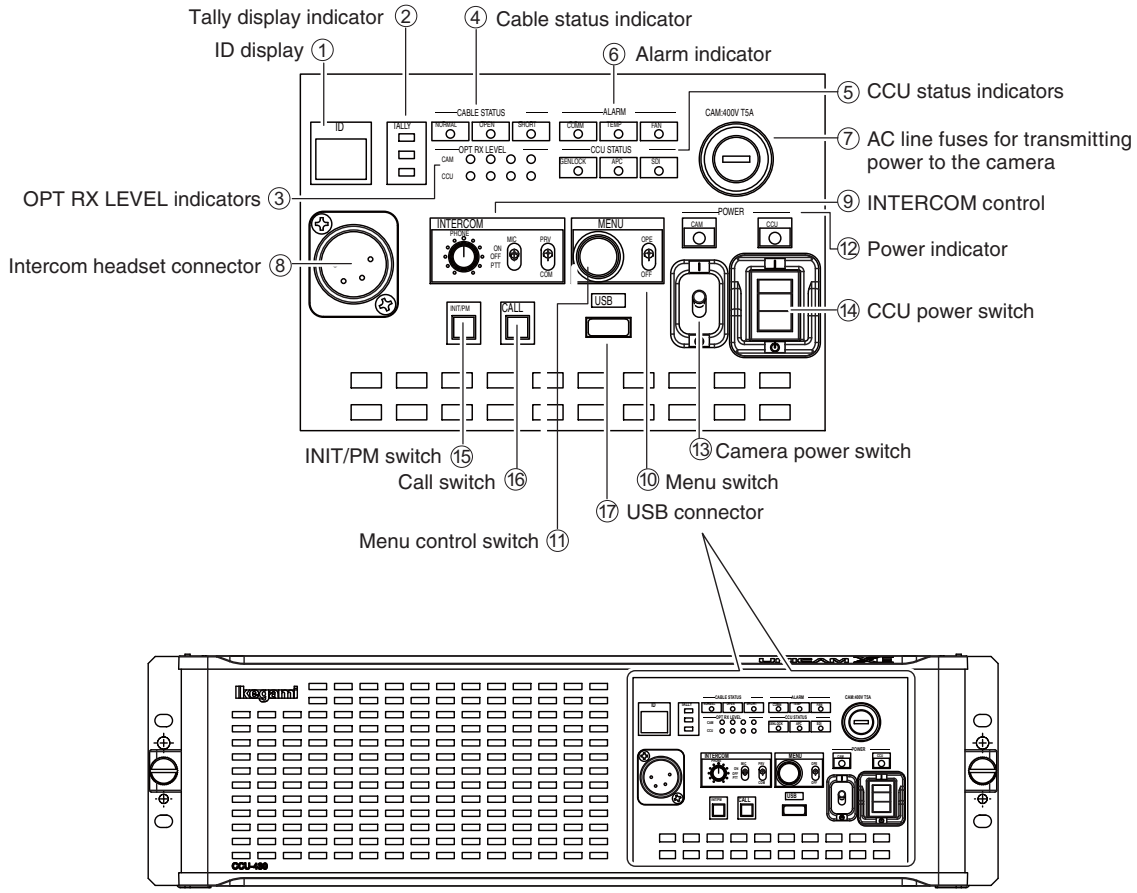


- Return video input channel
Displays the selected channel of the return video signals..

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.

2.3 CCU-430

CCU-430 Name and Function of the front display (with cover fitted)



(1) ID display

Displays camera program number.
It is set in the "PGM NO." item under the CONFIGURATION page on the CCU menu.
- Displays a setting value of 1 - 99 for CAM PGM No.

(2) TALLY indicators

The TALLY indicator displays Red tally, Green tally and Yellow tally.

R TALLY : Lights when the R TALLY signal is input to the TALLY IN connector on the rear of the CCU. It also lights while the CALL button on the camera or on any control panel (such as OCP, MCP, and RCP) is pressed.
G TALLY : Lights when the G TALLY signal is input to the TALLY IN connector on the rear of the CCU.
Y TALLY : Lights when the Y TALLY signal is input to the TALLY IN connector on the rear of the CCU.

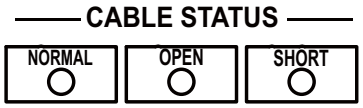
(3) OPT RX LEVEL indicators

"CAM" of the optical receiver level indicator indicates the reception status of the camera side, and "CCU" indicates the reception status of the CCU side.

Lighting Status	Light Reception Status	
R Yl Gr Gr ● ● ○ ○	OK	Optical signal reception status is good.
R Yl Gr Gr ● ○ ○ ●	ATTENTION	The optical reception level is low. Although there is no problem with the reception of signals transmitted, cleaning the fiber connector may be required, unless attenuation is due to very long cable length.
R Yl Gr Gr ● ○ ● ●	WARNING	The optical reception level is very low. There might be a problem with the reception of signals transmitted. Immediate cleaning the fiber connector is recommended.
R Yl Gr Gr ○ ● ● ●	NG	The optical cannot be received. There is a problem with the reception of signals transmitted. Cleaning the fiber connector is required; or replace the cable since the camera cable might be broken.

(○: ON/●: OFF)

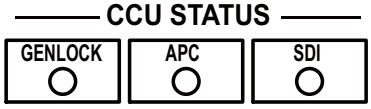
(4) Cable status indicators



The indicator that displays the status of the Hybrid Optic Camera Cable status.
Power is supplied from the CCU to the Camera only when the NORMAL light is on.
* Please check the camera cable status when OPEN or SHORT lights are on.

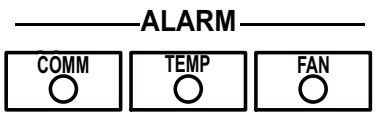
NORMAL (green) : It lights when the Hybrid Fiber-Optic Camera Cable is normal.
OPEN (red) : It lights when the Hybrid Fiber-Optic Camera Cable is not connected or is broken.
SHORT (red) : It lights when the power line of fiber cable is damaged, or the connector joint part has grounding fault due to water.

(5) CCU status indicators



GENLOCK (green) : Lights up when the proper synchronous coupling occurred to an external synchronizing signal that was input to the CCU.
APC (green) : Lights when the phase synchronization between the camera and the CCU is in normal status.
SDI (green) : Lights when the data transmission the CCU is normally received from the camera.

(6) Alarm indicator



COMM (red) : Lights when an abnormality is found in the data communication.
TEMP (red) : Lights when the temperature of the CCU is abnormally.high. (*1)
FAN (red) : Lights when the motor fan (fan for cooling) in the CCU power supply is stopped. (*2)

Caution :

*1 : If the TEMP alarm is turned on, immediately stop the operation of the CCU and check if the vent hole in the front and the exhaust hole in the back are not clogged with dust, etc.
*2 : If the FAN alarm lights up, stop the operation immediately and turn off the main power switch.

(7) AC line fuse for transmitting power to the Camera

Fuse for AC power line to the Camera.
Fuse to be used
400V T5A (rating)
("T" in the rating indicates a time lag fuse.)

(8) INTERCOM HEADSET connector

Connects the intercom headset.
The connector type varies depending on the destination of delivery and the order specification.

(9) Intercom control

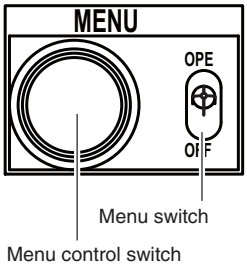
- PHONE : Adjusts the headset volume.
- MIC : Turns on/off the headset microphone. The PTT side is turned on only while it is pressed.
- PRV/COM : Switches the status of INTERCOM.
  PRV => Intercom only enabled between CCU and camera.
  COMM => Intercom enabled with the entire system.

(10) Menu switch

Controls the operation the CCU menu.
- OPE : Enables CCU menu display on the PM outputs .
- OFF : Disables the menu display on the PM outputs . The MENU control switch described in (11) is disabled.

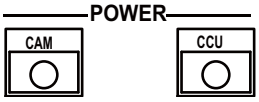
The menu is closed when the switch is changed from OPE to OFF while the menu is displayed.

(11) Menu control switch



The Menu switch presses the Menu control switch for 3 seconds on the "OPE" side , the CCU The menu is displayed on the the PM OUT (monitor output).
While checking the picture monitor outputs, turn the knob of the Menu control switch to move the cursor. Then, press the Menu control switch in the operation item to confirm.

(12) Power indicator (green)



The Power indicator displays the power supply statuses of the Camera and CCU.
Each lights (green) when power is supplied to the corresponding unit.

(13) Camera power switch

A switch used to supply power to the Camera.
When it is set to "ON", AC voltage is supplied. Set this switch to "ON" when operating in the Fiber Single mode.
When it is set to "OFF", the standby power supply of AC 27.5V is supplied.

(14) CCU power switch

ON/OFF switch for CCU power supply.
ON : Power is supplied to the CCU. Also, standby power is supplied when the Power switch of the Camera is set to "OFF".
OFF : Stops power to the CCU.

Caution:

If you turn off the power switch and then turn it on again, wait for 5 seconds before turning it on.

(15) INIT/PM switch

INIT/PM switch displays and switches various information including diagnosis information (failure diagnosis) on the picture monitor output.

(16) Call button

The R TALLY indicators for the Camera and control panels light only while this button is pressed.
Buzzer sounds if the device has a buzzer.

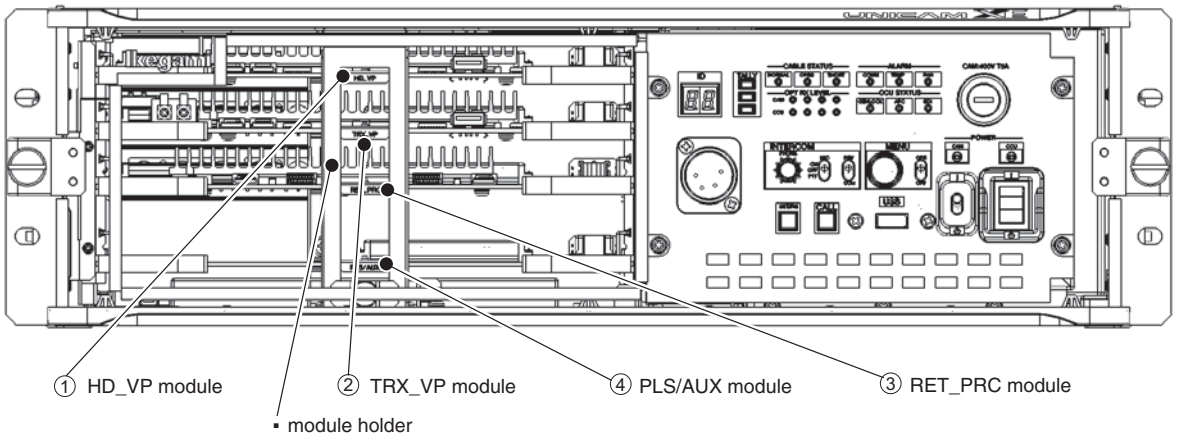
(17) USB connector

The USB connector is used to file operations.

Names and Functions of CCU-430 Front Inside Part (Cover Removed)

This section describes the modules mounted with the front cover of the CCU-430 removed.

■ *Name of Module*



(1) HD_VP module

This module is optional.
HD video signal processing is performed with down converter output or CUT OUT output.

(2) TRX_VP module

Performs 4K video signal processing.

(3) RET_PRC module

Performs processing of return video signals and viewfinder video signals.

(4) PLS/AUX module

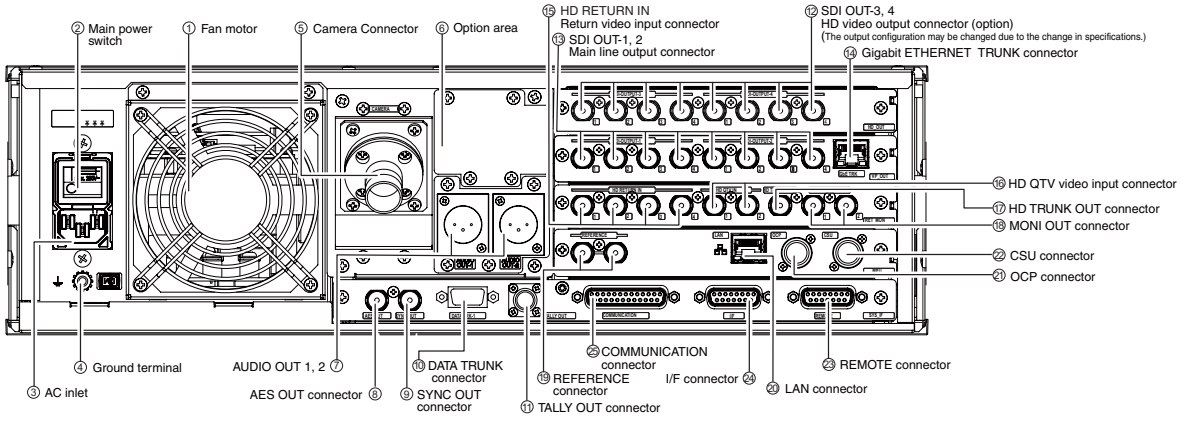
Performs processing of synchronization signals and intercom and audio signals.

Caution:

1 : Be sure the module stopper is always installed except when replacing the module.
2 : The switches inside the module, variable resistor and LED indicator are used during service implementation. **Never change the settings when using a general specification.**
3 : Some modules are connected with optical cables from the main unit of the CCU. **So please do not take it out the module unless you need to replace it. Otherwise, it may cause problems.**

Names and Functions of CCU-430 (Back)

■ *Names of CCU-430 (Back)*



Caution:

The connectors on the back include optional contents. The module to be inserted may be different (could be not inserted) depending on your specifications. In this document, the module (output slot) that outputs HD video in simultaneous operations is inserted.

■ *Function of CCU-430 (Back)*

(1) Fan motor

Fan motor to cool inside of the CCU.

(2) Main power switch

Main switch for CCU power supplies.

(3) AC inlet

AC inlet used to input AC100 to 120VAC and 220 to 240VAC commercial power supply to CCU.

(4) Ground terminal

A frame ground terminal for CCU.
It is connected to the housing rack frame of the CCU-430.

(5) Camera Connector

Connects the CCU and the camera with a hybrid optical fiber camera cable.
It supplies power to the camera, in addition, it sends and receives various data including main line video signals and communication commands, etc.

(6) Option area

A panel for special specification.

(7) Audio OUT (Analog) connector 1, 2

Outputs the audio signals that have been input to the MIC-1,2 (AUDIO IN) connectors of the camera.

(8) AES OUT Digital audio output connector

Outputs the audio signals that have been input to the MIC-1,2 (AUDIO IN) connectors of the camera. The signals are compliant with AES/EBU format.

(9) SYNC OUT (Synchronization signal output)connector

Outputs the signals for external device synchronization (Tri-level sync).

(10) Data trunk connector

This is a connector for RS-422 signal transmission between camera and CCU. (Channel #1)

(11) TALLY output connector

Output the TALLY OUT signals that are used for monitors, etc.

(12) SDI OUT (HD video output)- 3, 4 connector
Outputs two HD signals.

(13) SDI OUT (Main line video output)- 1, 2 connector
Outputs two 4K/HD video signals.

(14) Gigabit ETHERNET TRUNK connectors
The connector for Gigabit Ethernet line between the camera and the CCU.

(15) HD RETURN IN (Return video input) connectors
Inputs return signals to the Camera.
If ACTIVE-THROUGH is used, the return video signals are inputted by two systems (CH1 and CH3) and outputted by two systems (CH2 and CH4).

(16) HD QTV IN connectors
Inputs the HD-SDI QTV, SMPTE 292M, video signal (for promter) to be sent to the camera.

(17) HD TRUNK OUT connector
It outputs the HD-SDI TRUNK signal from the camera.

(18) MON OUTPUT (Monitor video output) connector
Connects to the picture monitor (PM), etc.
The PM output superimposes the characters of CCU MENU and DIAGNOSTIC INFORMATION. The VF output is a video sent to the viewfinder of the camera. The PM output and VF output can be assigned to each of 2 lines.

(19) REFERENCE (Synchronization signal) connector
It inputs the synchronization signal (HDTV tri-level SYNC or SDTV VBS/BBS) .
Loop-through connection (bridge connection) is possible, and a 75Ω terminator is required.

(20) LAN connector (Ethernet RJ45 (8P8C)
Connects the network compatible remote controller via HUB.

(21) OCP connector
Used to connect CCU and OCP. They are connected with a CP cable.
Equivalent to CSU connector mentioned in (22), and possible to connect to CSU.

(22) CSU connector
Connects CSU with a CP cable.
Equivalent to CSU connector mentioned in (21), and possible to connect to CSU.

(23) REMOTE connector
This is a connector used to externally control the microphone volume of the camera.

(24) I/F connector
Functions including DATA TRUNK #2, Camera Power indicator output, PREVIEW output are assigned.

(25) Communication connector
Inputs/outputs INTERCOM and TALLY. It also inputs PGM.

Refrence:

Refer to Chapter 9 for terminal sequences of a connector for external connection and terminal functions.

3

INSTALLATION and CONNECTION

3.1 Preparation

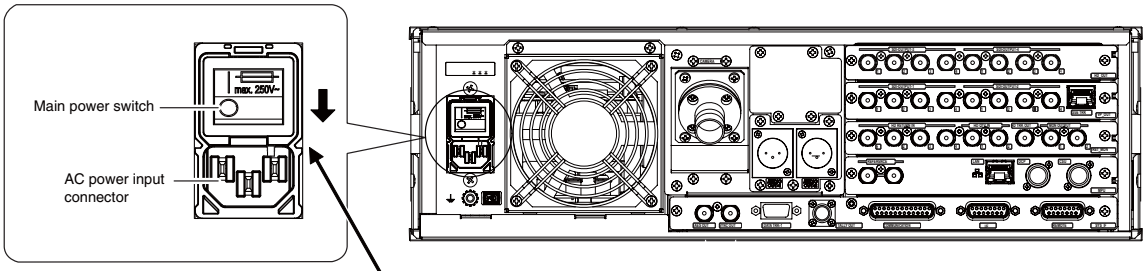
Product Use

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

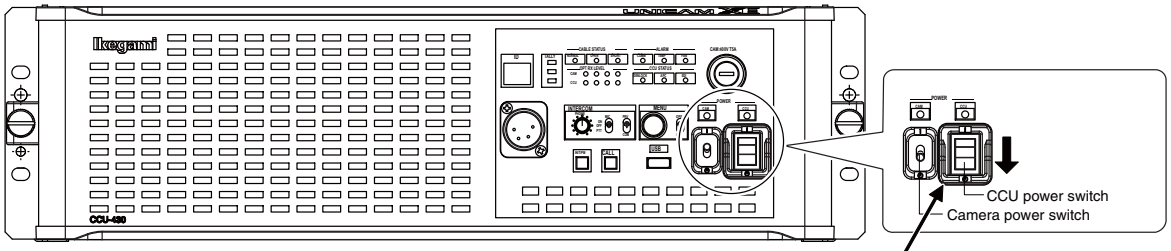
Be sure the Power switch is turned off before connecting this product (camera and CCU) to peripherals.

CCU Rear View



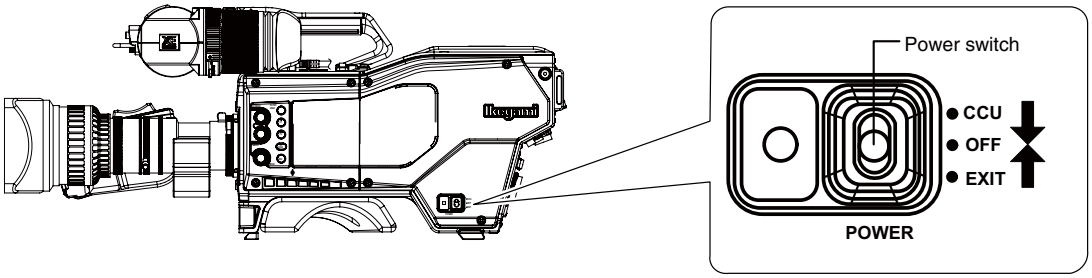
Check the Main Power switch is turned off.

CCU Front View



Check the CCU POWER switch on the front and the camera POWER switch are turned off.

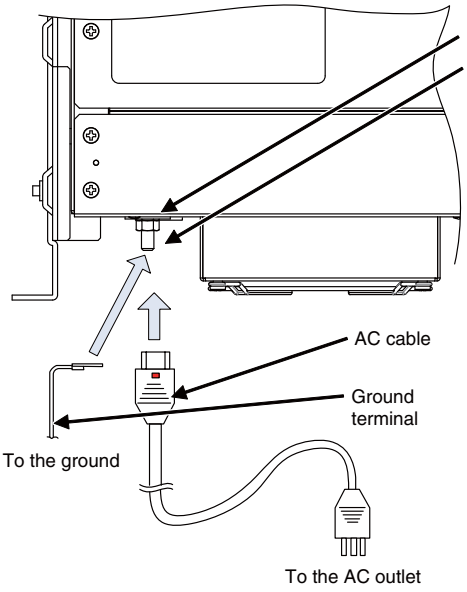
Camera Right View



Check the camera power switch is turned off.

3.2 Connecting the Power Cable and Camera Cable

Connecting the AC Power Cable to the CCU



1 Connect the AC cable to the AC INPUT connector on the rear of the CCU.

2 Insert the AC plug into the power outlet.

CAUTION

Do not turn on the main power switch.

3 Connect the grounding terminal on the housing rack using a ground wire.

Note:

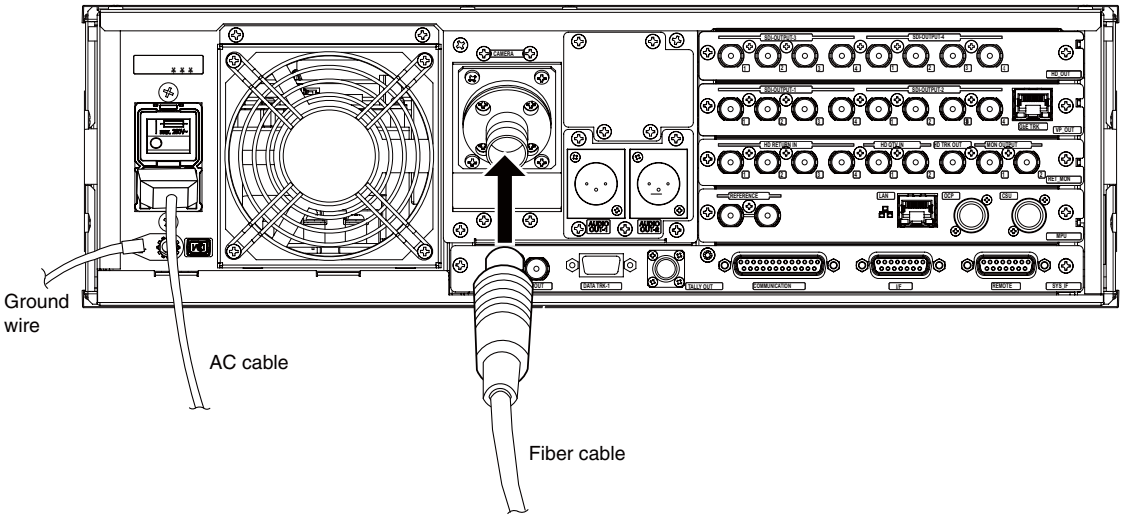
If a grounding line is provided at the AC outlet, the grounding terminal does not need to be connected.

Caution:

Be sure the power supply voltage for the device operating region and the input power voltage settings of CCU are correct. For details, refer to “SAFETY PRECAUTIONS”.

Connecting the Optical fiber Cable to the CCU

Refer to **"3.4 Connecting the CCU and Camera"** for how to connect the fiber cable to the camera.



3.3 Camera and Peripheral Installation and Connection

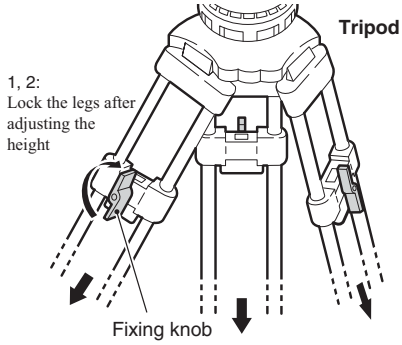
Mounting/Removing the Camera on/from the Tripod

■ *Mounting the Camera on the Tripod*

This section explains how to install the camera on the tripod. There are various types of tripods depending on the application and purpose. See the user's manual of your tripod for details on the tripod. This section is based on using a VIDEO-18 as an example.

1 Loosen the fixing knob and extend the tripod legs.

Adjust the height to suit your preferences.



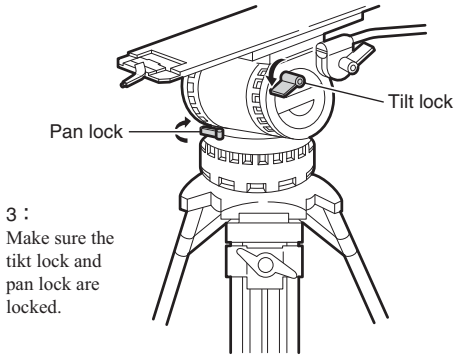
2 Check the level gauge on the pan head, and adjust the ball mount for a level head.

3 Check that the Tilt lock and Pan lock are secured.

If the locks are not secured or loose, tighten them.

Caution:

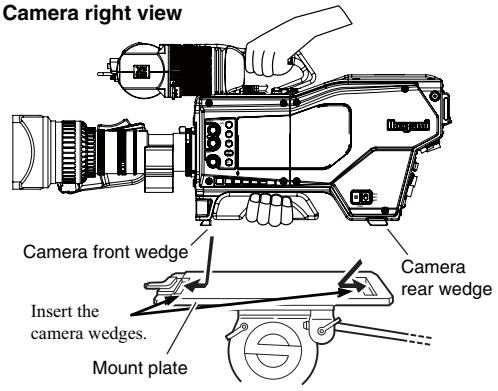
Be sure to tighten the fixing knob before mounting this product on the tripod.
If the tripod is not stable, the camera may fall off when mounting, resulting in damages or injury.



4 Attach the tripod plate to the pan head. Insert the edge of the rear wedge of the camera into the slot on the mounting plate.

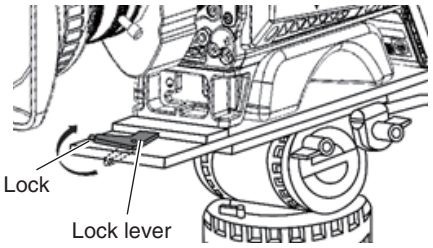
Push it toward the rear, to hook the edge.

Camera right view



5 Lower the camera front wedge into its slot, and tighten the lock lever to fix the camera.

Turn it until you hear a click. You hear a click when the lock lever is locked.



5：Tighten the lock lever to fix the camera.

6 Secure the camera on the tripod so that it does not rattle.

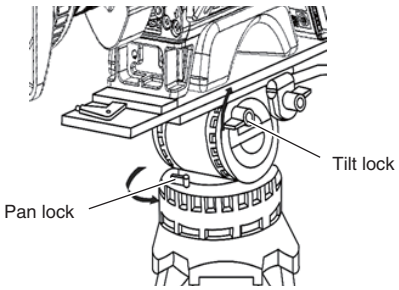
Caution:

If the camera and tripod rattle, the camera may fall off, resulting in damages or injury.
Causes of rattling may include: Loose lock lever; abnormality in the front/back edge, mounting brackets, and tripod.
Also check if the shape of the tripod mounting plate is okay.

7 Loosen the Tilt lock and Pan lock to adjust the tilt and direction of the camera.

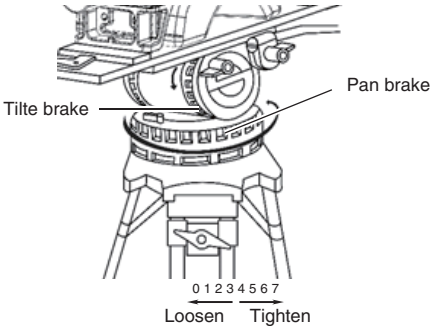
The friction is less when the Pan brake and Tilt brake are turned to the direction with a small number, so the camera moves smoothly. On the other hand, the friction is greater when they are turned to the direction with a big number, so the camera does not rotate easily.

Camera right view



7：Loosen the Tilt lock and Pan lock to adjust the tilt and angle orientation of the camera.

8 When the tilt and angle orientation of the camera is determined, tighten the Tilt lock and Pan lock to secure it.



8：Tighten the Tilt lock and Pan lock to secure it.

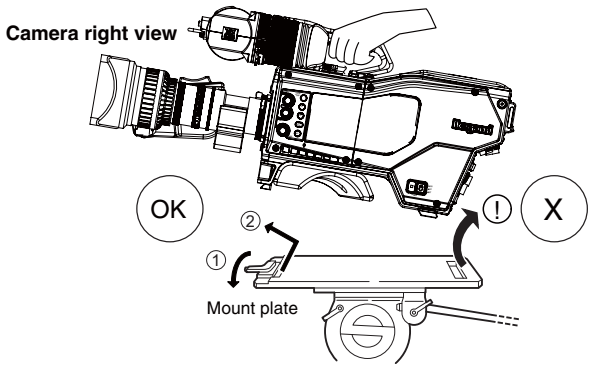
■ *Dismounting the Camera from the Tripod*

This section explains how to dismount the camera from a tripod.

1 Press the red button on the lock lever to release the lock.

Be sure to hold the camera handle when dismounting so that the camera does not fall.

2 Slightly lift the front part of the camera and push it forward to remove the rear edge. Then, lift the camera to dismount from the tripod.



Caution:

If you try to pull the camera towards the back without removing the rear edge, the camera wedge or tripod plate may be damaged. To dismount the camera, be sure to release the lock lever first (1), and push the front part of the camera forward to remove the rear wedge, and then lift the camera to dismount (2)

.

Mounting and Removing the Lens

■ *Mounting the Lens*

This section explains how to mount the lens to the camera.
Place the camera on the tripod or in a stable and horizontal position when mounting the lens.
Also, the lens mount of the camera is compatible with the BTA mount system.

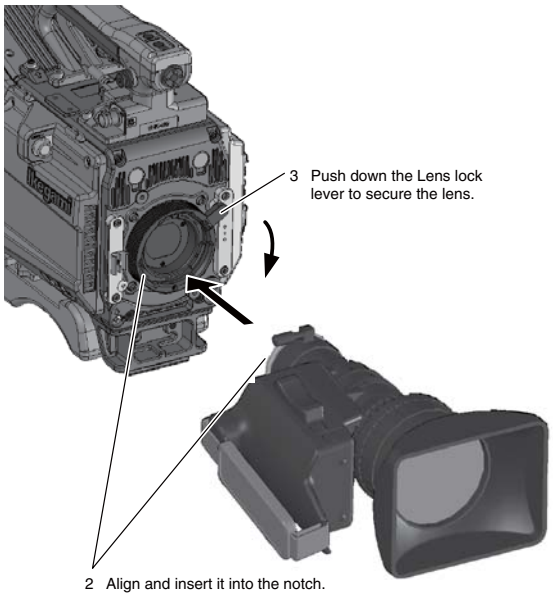
1 Lift the Lens lock lever and remove the lens cap in advance.

2 Align and horizontally insert the pin of the lens into the notch of the camera lens mount.

Put a hand on the lens to prevent it from falling.

3 Secure the lens to the camera.

Push down the Lens lock lever to secure the lens to the camera.



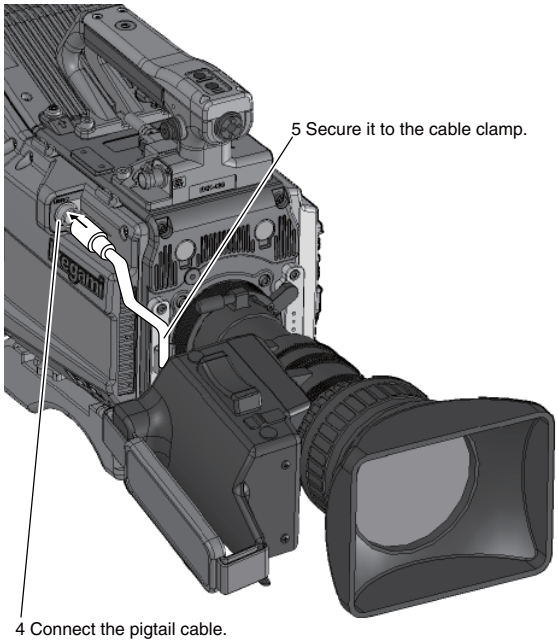
4 Connect the pigtail cable to the lens connector.

The pigtail cable is automatically locked when it is aligned with the connector pin and pushed in.

5 Secure the pigtail cable to the cable clamp so the cable is properly positioned.

Caution:

Do not hold and carry the entire camera by the housing part of the lens. Abnormal force on the lens mount may cause failure.

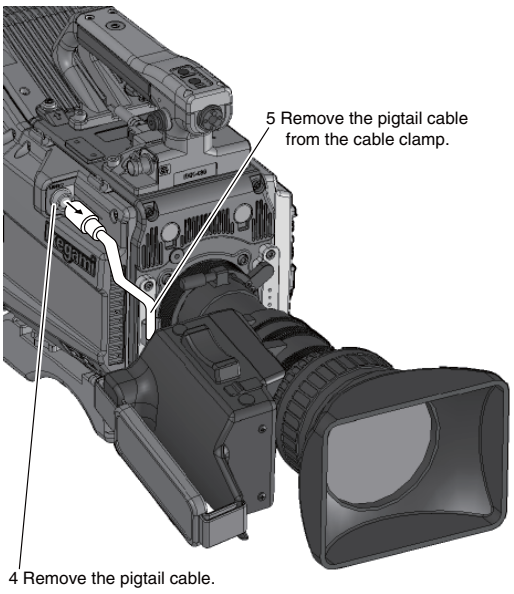


■ *Removing the Lens*

This section explains how to remove the lens from the camera.
Place the camera on the tripod or in a stable and horizontal position when removing the lens.

1 Remove the pigtail cable from the lens connector.

Pull on the connector ring of the pigtail cable to release the lock and remove the connector.



2 Remove the lens from the camera.

Push down the Lens lock lever and remove the lens from the lens mount of the camera in a horizontal direction.
Put a hand on the lens to prevent it from falling.

3 Remove the pigtail cable from the cable clamp.

4 Attach the lens cap at the lens opening when no lens is mounted.

Mounting and Removing the Viewfinder

■ *Mounting the Viewfinder*

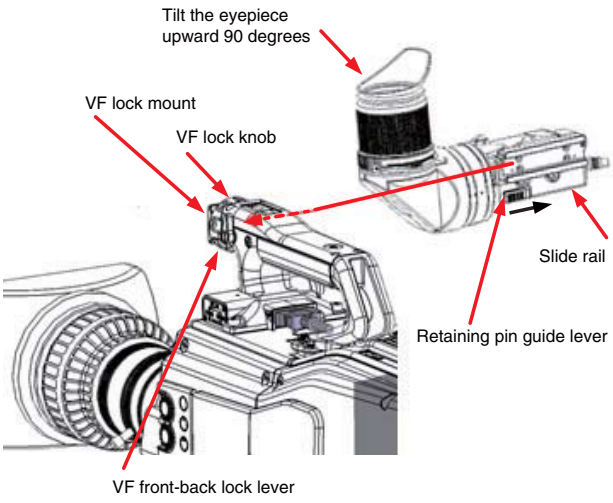
This section explains how to mount the viewfinder (VFL201D).

1 Check the Power switch of the camera is turned off.

If the POWER switch of the camera is set to "CCU" or "EXT", set it to "OFF".

2 To attach the viewfinder from the left side of the camera, stand up the eyepiece at a 90 degree angle.
Insert the Slide rail of the viewfinder into the VF lock mount on the handle.

Slide it to the right until you hear a click. When it is locked by the lock pin of the guide, you hear a click.

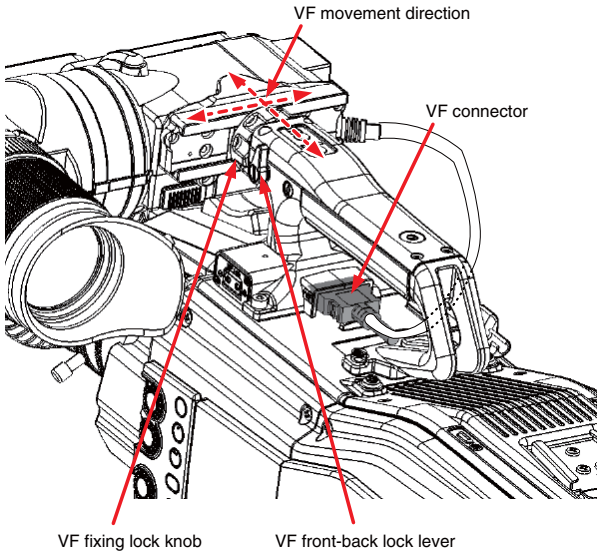


3 Connect the VF cable to the VF connector on the camera handle.

Align the connector and insert it until hear a click. When it is locked by the connector latches, you hear a click.

Caution:

Be careful not to catch your fingers in the Lock lever or Guide-Rail when attaching the viewfinder, you may get injured.



■ *Adjusting the position of the viewfinder (left and right, back and forth)*

1 Loosen the "VF lock knob" and hold and slide the VF left and right to adjust the position of the viewfinder. After determining the desired position, tighten the "VF lock knob" to fix the VF.

2 Loosen the "VF front-back lock lever" and hold and slide the VF back and forth to adjust the position of the viewfinder. After determining the desired position, tighten the "VF front-back lock lever" to fix the VF.

Caution:

When adjusting the VF left and right, adjust it with the "Retaining Pin" engaged. If the left and right adjustment is performed without the "Retaining Pin" engaged, the VF may fall off

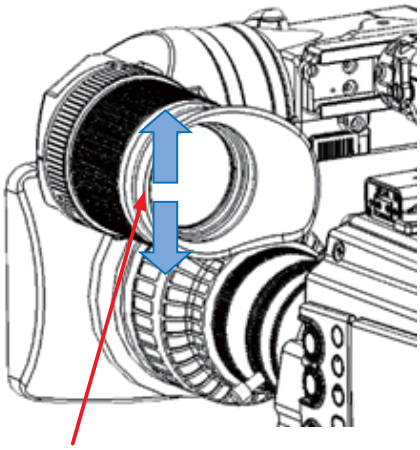
■ *Removing the Viewfinder*

1. Check the power of the camera is turned off.
2. Remove the VF connector.
3. Loosen the VF fixing knob.
4. Slide the VF retaining guide lever and release the lock of the lock pin. Then, slide the viewfinder to remove it. Turn the eyepiece 90 degrees and stand it up when removing the viewfinder, so that you can remove it easily.

Adjust the eypiece position of viewfinder

■ *Adjusting the Angle of Eyepiece*

Move the eyepiece to adjust the position so that you can comfortably see the viewfinder screen. The eyepiece can be rotated up to 160 degrees upward and 90 degrees downward. Adjust the angle in accordance with the camera angle.



Adjust the angle to upward and downward.

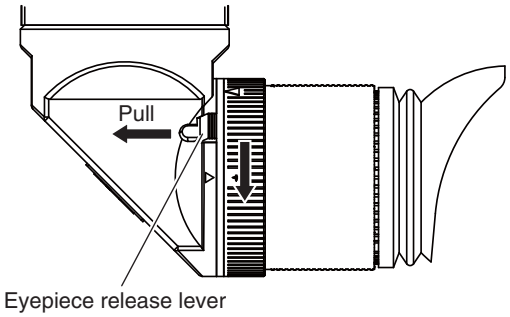
■ *Removing the Eyepiece*

This section explains how to remove the eyepiece.

1 Pull the eyepiece release lever and turn the eyepiece in the direction of arrow.

The lock of the eyepiece is released.

2 Pull out the eyepiece.



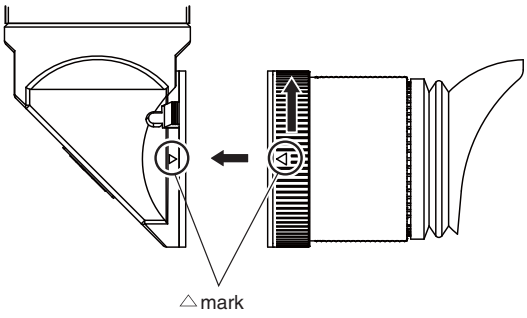
■ *Attaching the Eyepiece*

This section explains how to attach the eyepiece.

1 Align △ mark on the viewfinder with △ mark on the eyepiece, and the eyepiece.

2 Turn the eyepiece in the direction of arrow.

Turn it until you hear a click.
You hear a click when the eyepiece is locked.



Attaching a Microphone

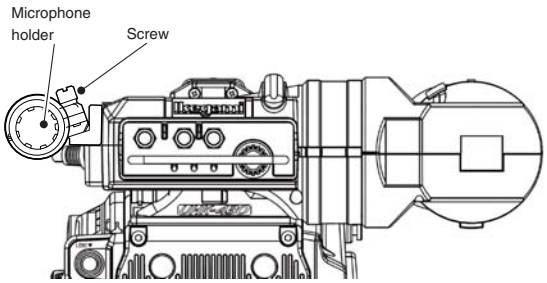
The camera supports connection of two microphones (MIC-1 and MIC-2), depending on the application.
This section explains how to attach a microphone to the microphone holder on the viewfinder.

Note:

The microphone holder is optional.

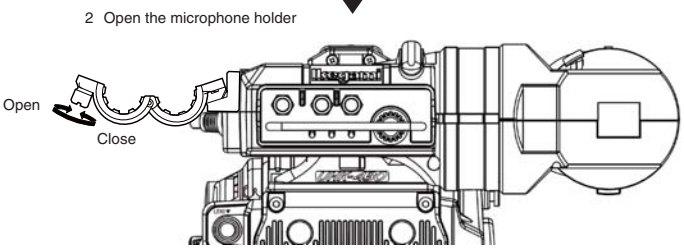
1 Check if a microphone holder is attached to the viewfinder.

If a microphone holder is not attached, attach the holder to the microphone holder mount on the viewfinder.



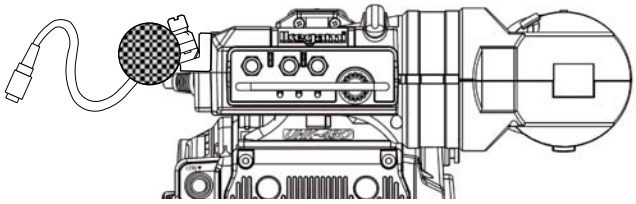
2 Loosen the microphone fixing screw on the microphone holder to open it.

3 Put the microphone in the opened microphone holder and tighten the screw to secure it in place.



4 Connect the microphone cable to the MIC-1 connector on the back of the camera.

(Same for the MIC-2 connector.)



5 Secure the microphone cable with the cable clamps to remove any slack.

Reference:

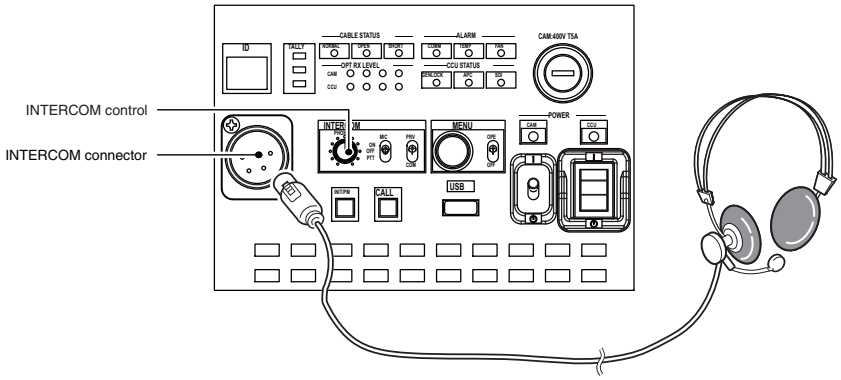
The power supply method is different depending on the types of the microphone used. Please refer to **"Chapter 4 : OPERATION" "4.2 Switch Position Check" (P. 60)** for switching the power supply.
Also refer to the operation manual of your microphone for more information on the microphone.

Connecting Headsets

The intercom system of this product (camera and CCU) includes two intercom lines (ENG and PROD).
Please select either or both of the intercom channels depending on your application. This section explains the case where the ENG channel is used.

■ *Connect a the Headset to the CCU*

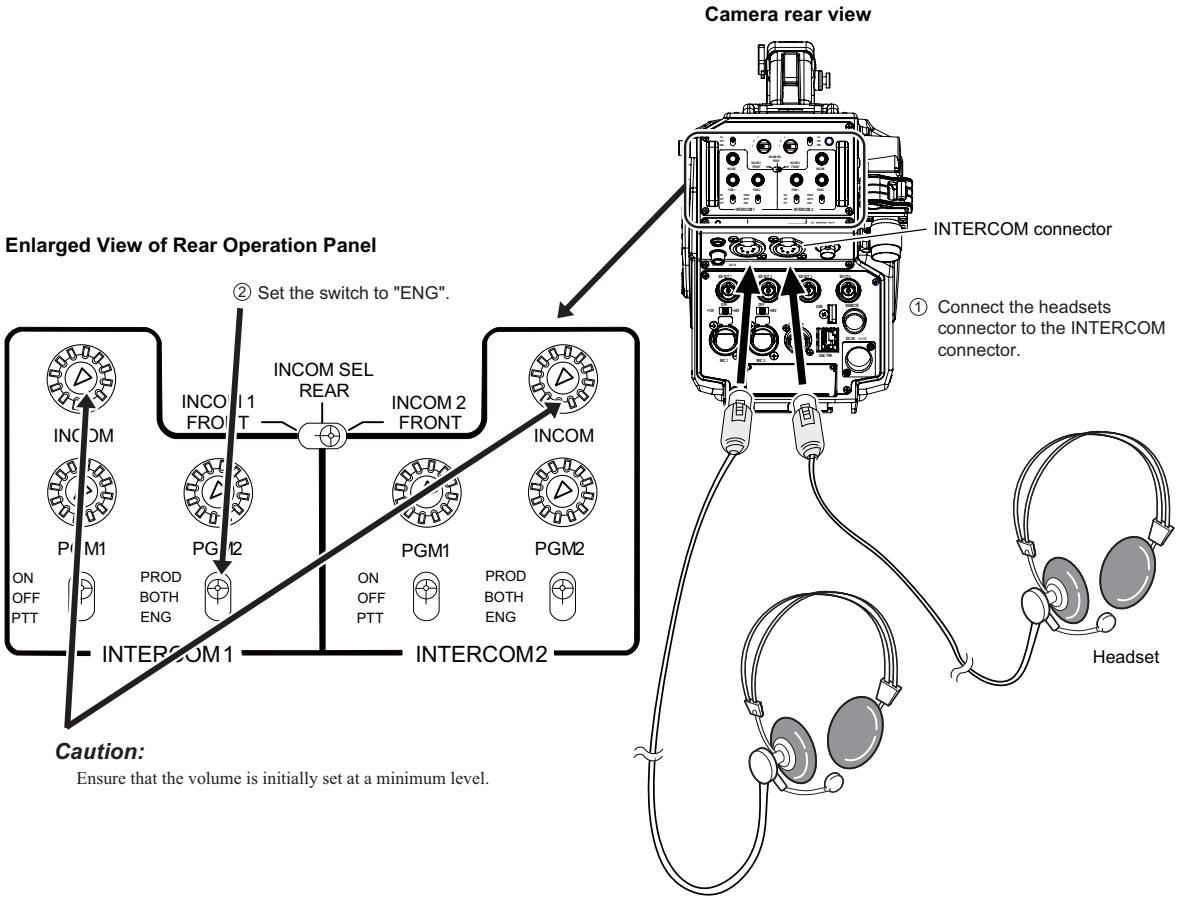
Turn the INTERCOM PHONE control to set the volume at minimum level, and take the headset off your ears.



■*Connecting a Headset to the Camera*

1 Connect a headset to the INTERCOM-1 connector.

2 Set the INTERCOM-1 TALK selector switch to "ENG".



Caution:

Ensure that the volume is initially set at a minimum level.

Note:

The INTERCOM connectors are compatible with XLR series or 1/4-inch type phone jack by the specifications at the time of delivery.

Caution:

Do not set the volume of intercom receiver to near maximum level from the beginning. Using the headset 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 **"Chapter 5 : CAMERA SETTINGS and ADJUSTMENT" "Adjusting Headset Volume" (P. 79)** for the audio volume adjustment of intercom.

Attaching a Shoulder Belt

The camera includes hooks to attach a shoulder belt. Please use the shoulder belt depending on your operating conditions.

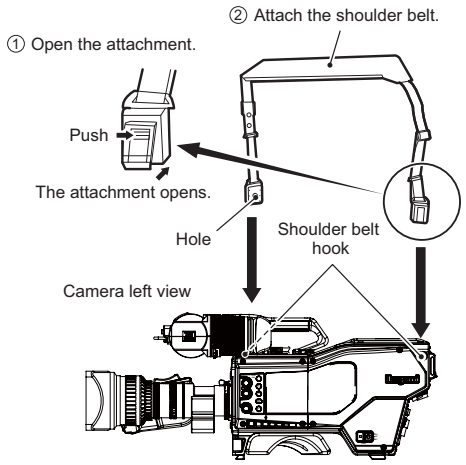
1 Press the upper part of the shoulder belt tab to open the attachment.

2 With the attachment open, align the hole in the attachment with the camera shoulder belt hook (right side rear, left side front), and pull the shoulder belt upwards.

Check the shoulder belt attachments are securely attached to the shoulder belt hooks.

Caution:

If the shoulder belt attachments are not securely attached to the shoulder belt hooks, the camera may fall, resulting in damages or injury.



Connecting a Monitor to the Camera

There are four connectors on the camera to output various image signals. The video output signal from each connector can be independently set. The setting of the output video signals is performed in the Menu. One of four lines is used for video output or video input. Switching is performed in the Menu.

■ I/O connector

- SDI OUT 1
- SDI OUT 2
- SDI OUT 3
- SDI-I/O 4

■ I/O video signal

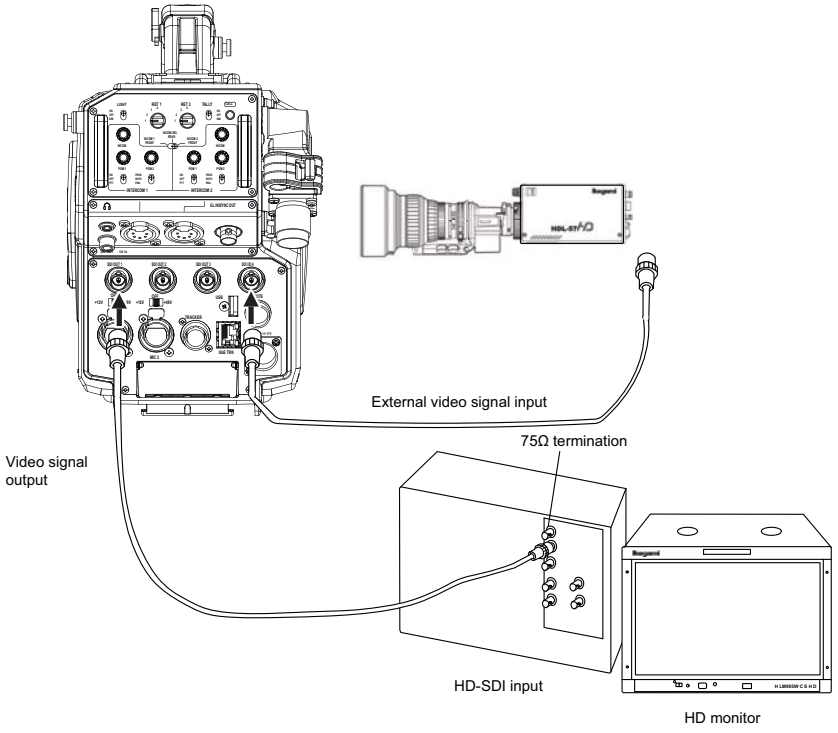
- VF : Outputs the same video signals as the viewfinder.
- MONI : Outputs the monitor video signals.
- RET-1 : Outputs the return video signal 1.
- RET-2 : Outputs the return video signal 2.
- RET-3 : Outputs the return video signal 3.
- RET-4 : Outputs the return video signal 4.
- QTV-1 : Outputs QTV-1 video signals.
- QTV-2 : Outputs QTV-2 video signals.
- RET-1 SEL : Outputs the return video signals selected by “RET-1 selector switch” on the back side of the camera.
- RET-2 SEL : Outputs the return video signals selected by “RET-2 selector switch” on the back side of the camera.
- RET-3 SEL : Outputs the return video signals selected by “RET-3 selector switch” on the back side of the camera.
- HD TRUNK : Inputs the HD-SDI signals. The input signals are outputted from the HD TRUNK connector of CCU.

Note:

HD TRUNK can be assigned to SDI I/O 4 only. The input signals need to be synchronized with the system and locked.

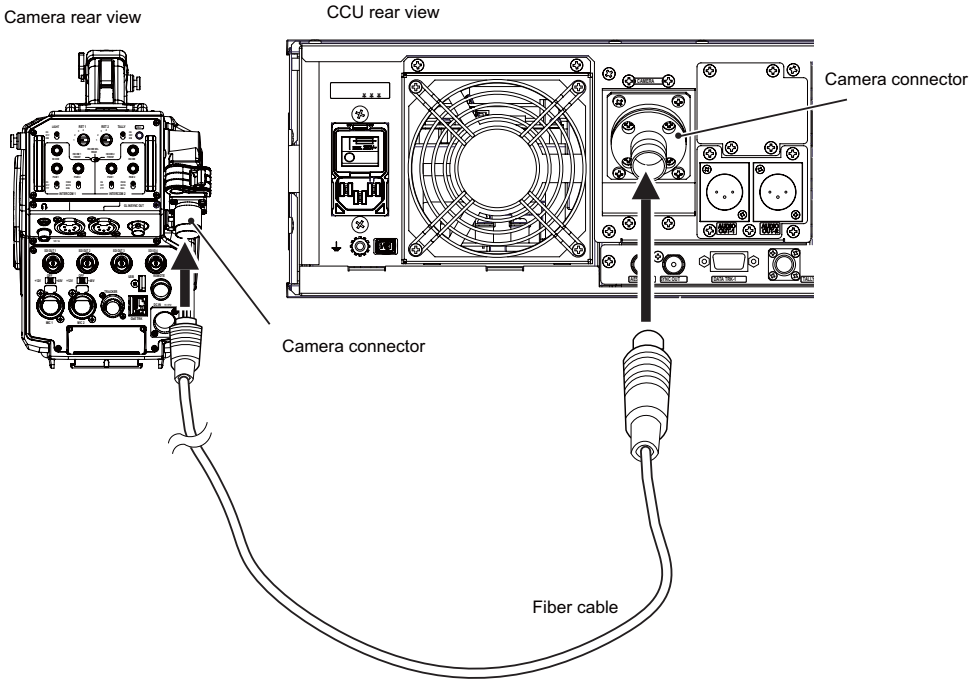
■ Example

- When QTV signals are outputted to SDI OUT 1
- When used as external video signals in SDI I/O 4



3.4 Connecting the CCU and Camera

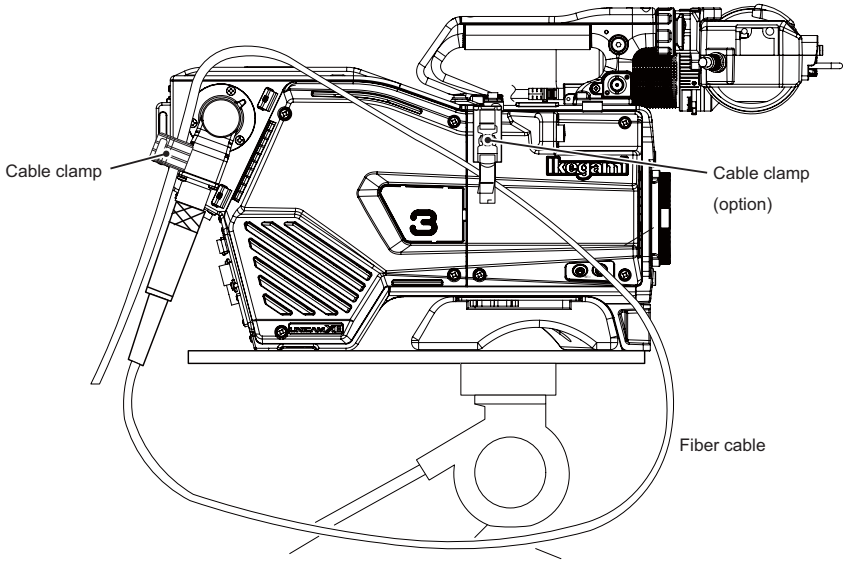
Connecting the Camera Cable (Fiber Cable)



1 Connect the CAMERA connector on the back of the CCU and the CAMERA connector on the back of the camera with a fiber cable (hybrid fiber camera cable).

Caution:

- The camera cable has a male plug connector on one end and a female socket connector on the other end. Be sure to connect the female plug connector to the camera and the female socket connector to the CCU.
- Secure the fiber cable (hybrid fiber camera cable) with the CAMERA CABLE clamp on the camera to reduce stress. 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.



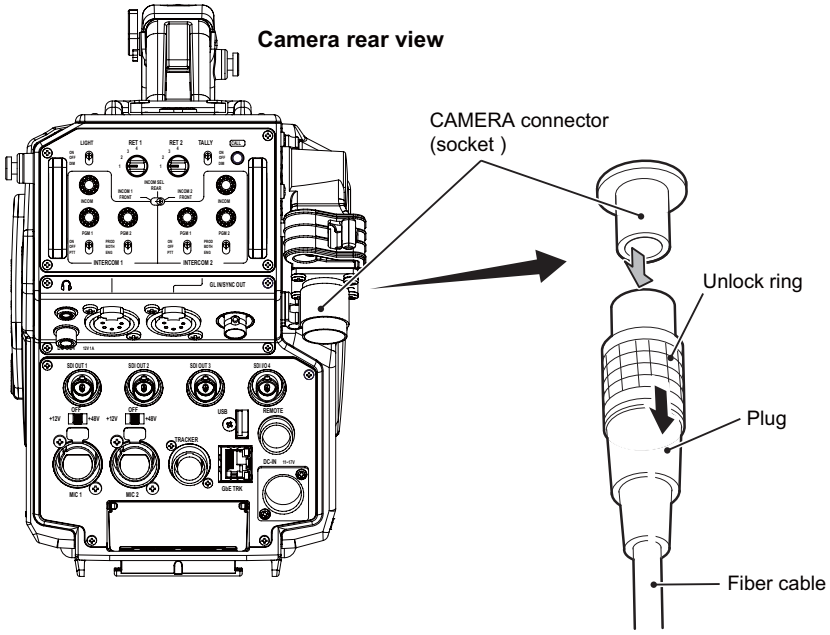
Removing the Fiber Cable

This section explains how to remove the camera cable (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.

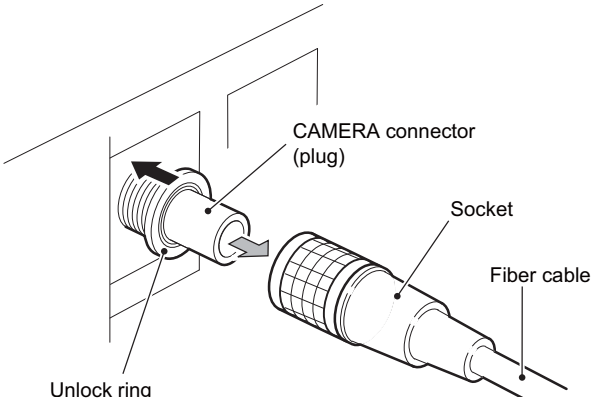
■ *Camera*



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

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

■ *CCU*

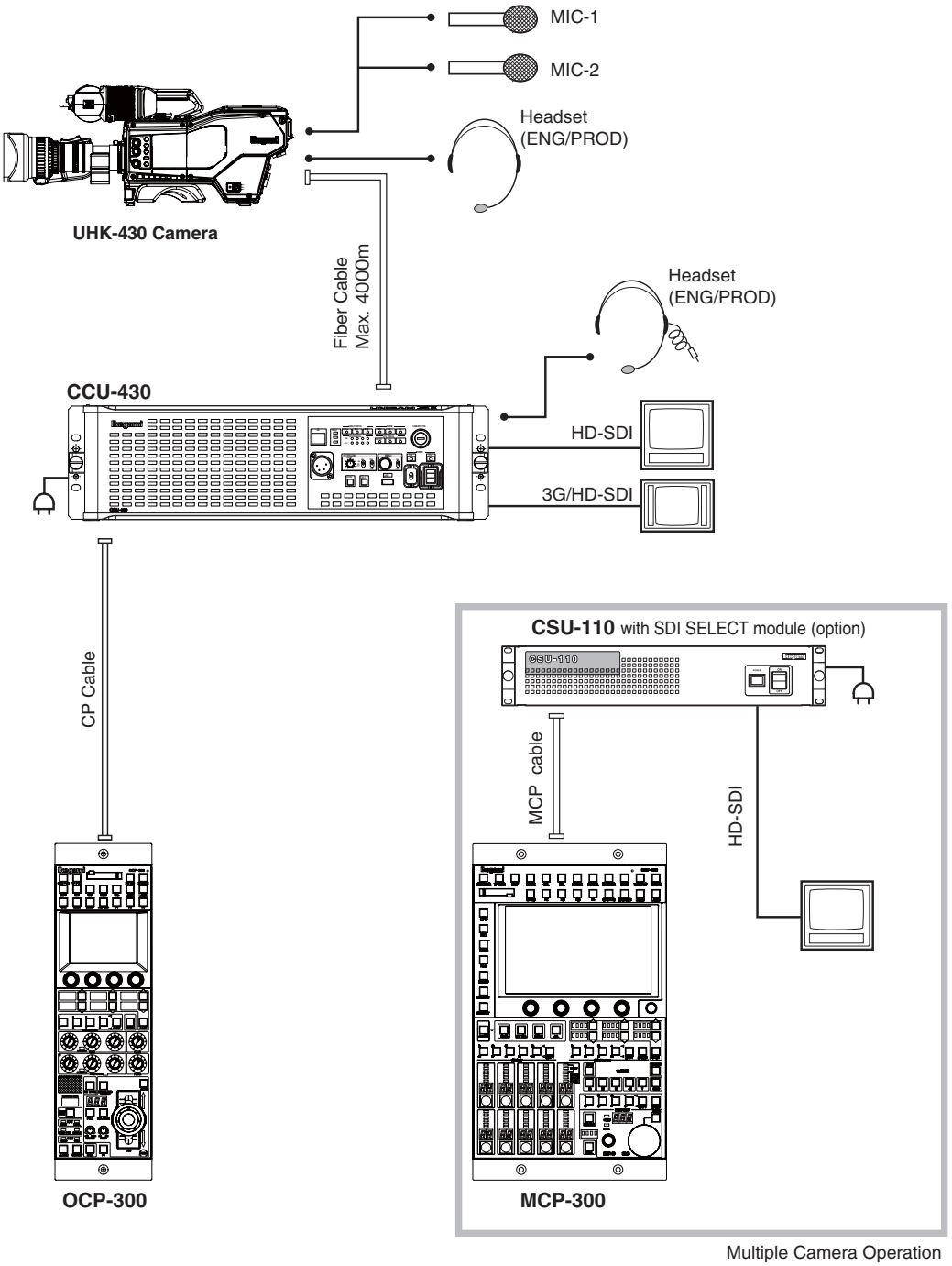


2 Remove the cable from the CCU-430 while pushing the unlocking ring of the CAMERA connector on the rear of CCU-430.

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

3.5 System Setup Diagram

■ *Basic system*



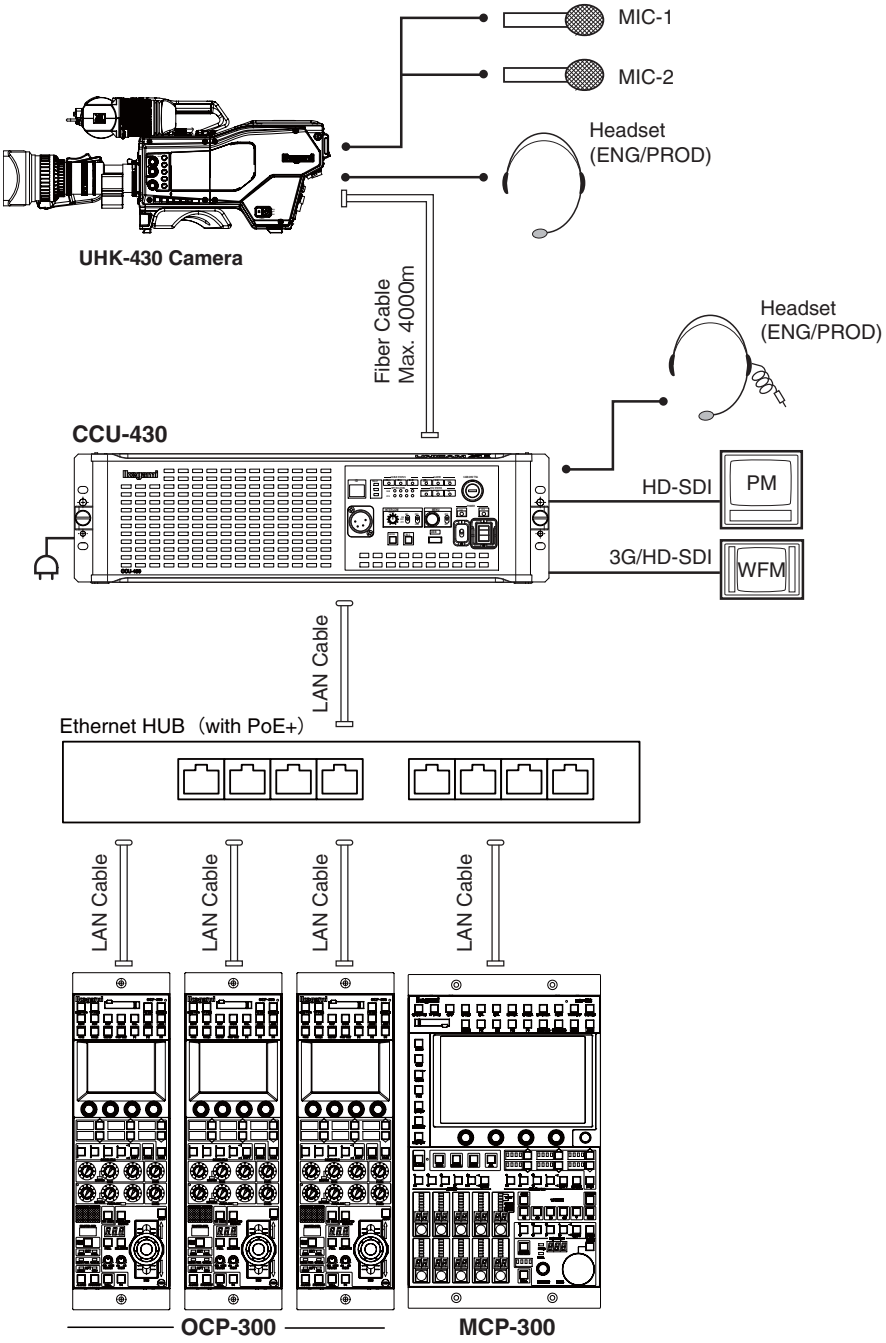
Multiple Camera Operation

Caution:

1 : Refer to the operation manual of OCP-300, MCP-300, and CSU-110 for the maximum length of the usable CP cable and MCP cable.

2 : The maximum usable length of the fiber cable is the distance in the case of the standard conbination, which is connected to a portable lens and a 2inch VF. The maximum length is limited by the use of the utility power supply at the camera side, the load increases and the characteristics of the commercial power supply input to the CCU.

■ *ETHERNET compatible system*



Caution:

1 : Refer to "OCP-300/MCP-300 Operation Manuals" for more details on the ETHERNET connection.
2 : The maximum extension distance of the LAN cable is "100 m" range.
3 : On network operation, commands can be switched from OCP, MCP, or CPH. It is also possible to switch the video signal from CSU-110. However, when using the MCP-200 and the cable length is long, an external power supply (DC+12 V) is required.
4 : The maximum usable length of the fiber cable is the distance in the case of the standard conbination, which is connected to a portable lens and a 2inch VF. The maximum length is limited by the use of the utility power supply at the camera side, the load increases and the characteristics of the commercial power supply input to the CCU.

3.6 About the GENLOCK System

This section explains the input connector, output connector, and connection examples of the GENLOCK system of this product.

■ *Input synchronization signals*

The output video signals are synchronously coupled to the standard synchronization signal input to the "REFERENCE" connector. The phase between the output video signals and standard synchronization signals can be changed in horizontal or vertical from the Menu.
Two types of signals below can be input to the REFERENCE connectors.

- HDTV PS/S (Tri-level sync)
- SDTV VBS/BBS (NTSC / PAL)

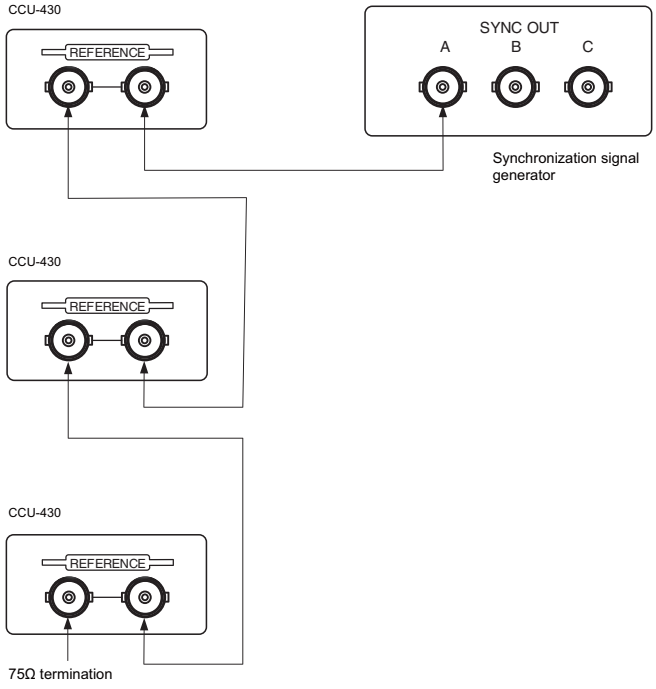
■ *Output synchronization signal*

The "SYNC OUT" connector outputs a synchronization signal that matches with the output video signals.

■ *Synchronization signal input (REFERENCE) connector (loop through)*

Input reference synchronization signals to the REFERENCE connectors.

(1) When an external synchronization signal generator is used.



4

OPERATION

4.1 Operating Procedures

This chapter explains how to operate the UHK-430 camera.

Initial Operation Check

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

- ◆ Switch Position Check.....(P. 60)
- ◆ Turning ON Power .....(P. 61)
- ◆ Output Signal Check .....(P. 65)
  - - Test Pulse Check (CAL Signal)
  - - Color-Bar Signal Check
  - - Check by Use of External Chart

Preparation Before Shooting

Studio Operation

- ◆ Viewfinder Adjustment..... (P. 67)
  - - Diopter Adjustment and Screen Adjustment
  - - Display Mode Check
- ◆ Output Signal Check ..... (P. 65)
  - - Color-Bar Signal Check
  - - Test Check (CAL Signal)
  - - Check by Use of External Chart
- ◆ Auto Setup ..... (P. 69)

<Pattern 1>
1 LEVEL Auto Setup
2 Black Shading

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

<Pattern 3>
1 Auto White Balance (AWB)

(Execute one of the above patterns.)

Outdoor operation

- ◆ Shooting in a Particular Environment .. (P. 75)
- ◆ Viewfinder Adjustment..... (P. 67)
  - - Diopter Adjustment and Screen Adjustment
  - - Display Mode Check
- ◆ Output Signal Check ..... (P. 65)
  - - Color Bar Signal Check
  - - Test Check (CAL Signal)
  - - Check by Use of External Chart
- ◆ Auto Setup ..... (P. 69)

<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 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.

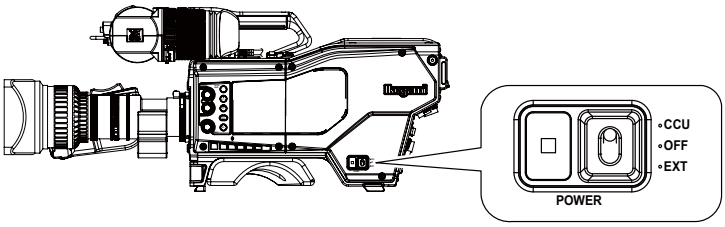
- ◆ Camera menu settings
  Refer to "Chapter 5 :CAMERA SETTINGS and ADJUSTMENT" (P. 77)

4.2 Switch Position Check

When you use this product for the first time please set the switches of the camera as follows, and check if it operates normally. After finishing the operation check, set the switches as needed for your operating environment and shooting conditions..

■ *Camera right view*

Turn the camera power switch to the CCU position to be prepared for the power activation after connecting the camera cable and other cables.

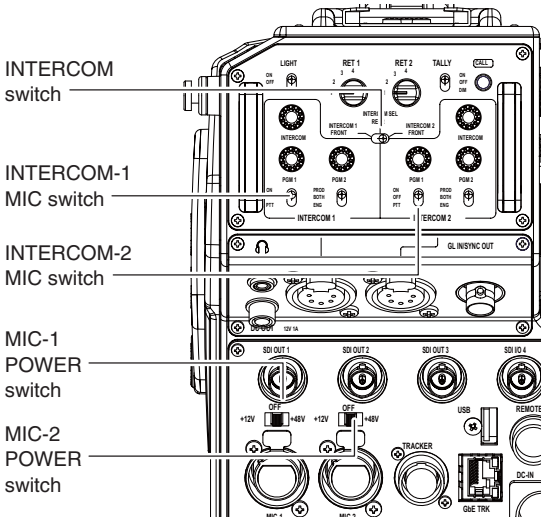


■ *Camera rear view*

- INTERCOM switch : OFF
- INTERCOM-1 MIC switch : ON
- INTERCOM-2 MIC switch : ON
- 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

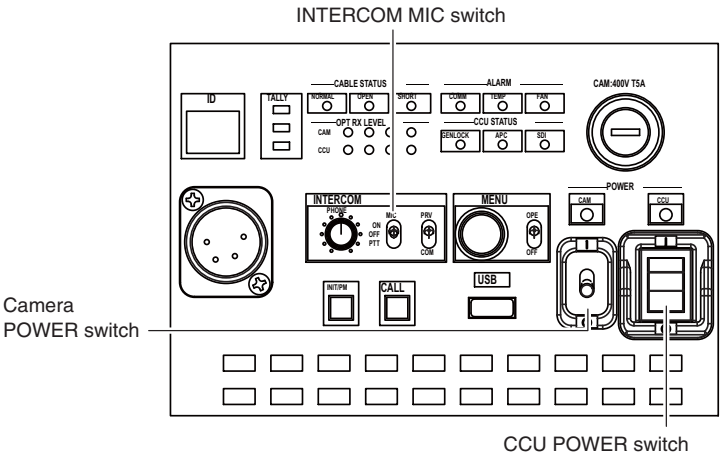


Reference:

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

■ *CCU front view*

- INTERCOM switch : OFF
- Camera POWER switch : OFF
- CCU POWER switch : OFF



4.3 Turning ON Power

The procedure for turning on the power is different depending on how to supply power to the camera. This section explains how to supply power from the CCU or from the POWER connector (external power supply) to the camera. If the power supply needs to be terminated immediately, remove the cable connected to the CAMERA connector or AC inlet.

To operate the power supply from CCU

Before turning on this product, set the switches as follows.

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

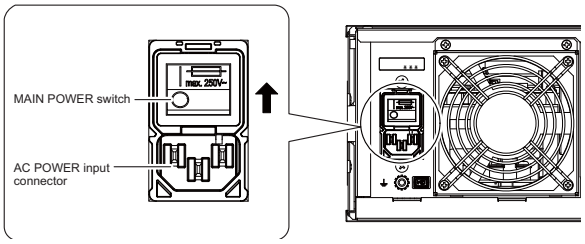
(*) When the OCP-300 is used, the setting for the camera POWER switch on the CCU is not necessary.

■ *To operate the power supply of the camera from the CCU*

1 Turn ON the MAIN POWER switch on the CCU rear side.

Caution:

When the MAIN POWER switch is set to "OFF", the power will not be supplied even if the POWER switch on the front of CCU or the POWER switch of the camera are turned on.



2 Set the [MAIN POWER] switch on the front of CCU to "ON".

Caution:

For first time use after installation or after re-installing in a new location, confirm the AC voltage of the power source to the CCU matches the power selection setting of the CCU before connecting the fiber cable to the camera.

Confirm the AC voltage of the power source to the CCU, measure the voltage if necessary.

Confirm the CCU power selection setting by connecting an HD monitor to the MONI OUT on the CCU, and calling up the CCU Menu. Navigate to DIAGNOSTICS, then observe AC VOLTAGE SELECTOR to see the voltage setting. For details on Menu operation, refer to “6.1 Basic operation of menu screen”.

If the AC voltage of the power source matches the AC voltage setting of the CCU, you may proceed to turn the Camera power On. If the voltage does not match, switch Off the CCU and Main power, and contact Ikegami for service information regarding the CCU voltage setting.

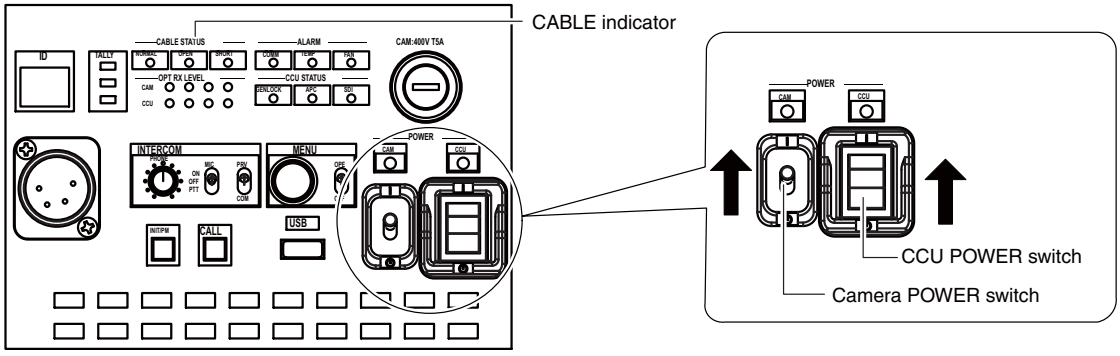
The CCU checks the fiber cable connection and supplies power to the camera if the cable is properly connected. The CABLE indicator on the CCU will indicate the connection status of the fiber cable.

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.

3 When the [Camera POWER] switch of the front of CCU is set to "ON", the power is supplied to the camera, and the "CAM" POWER indicator lights up.

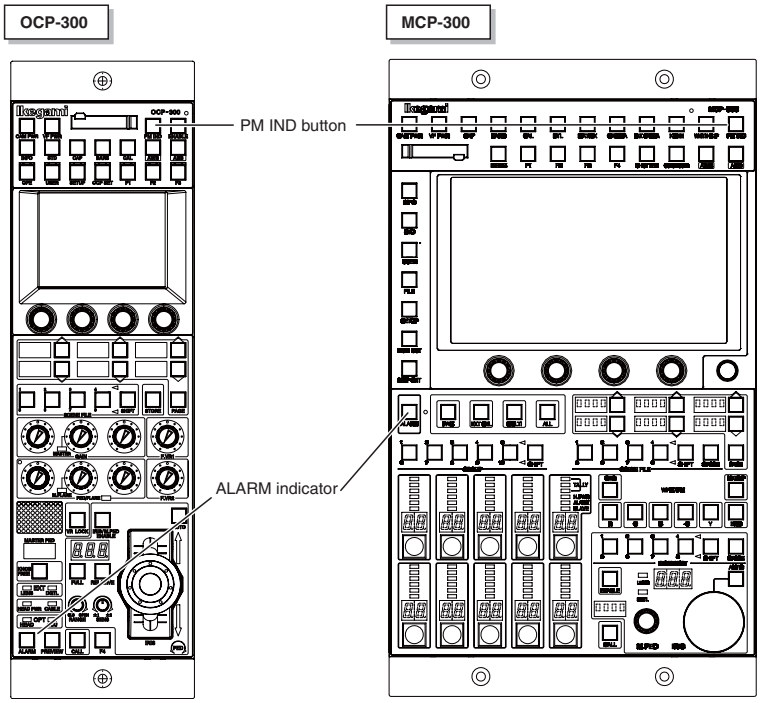
4 To turn off the power of the camera from the CCU side, set the [Camera POWER] switch of the front of CCU to "OFF".

CCU front panel



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

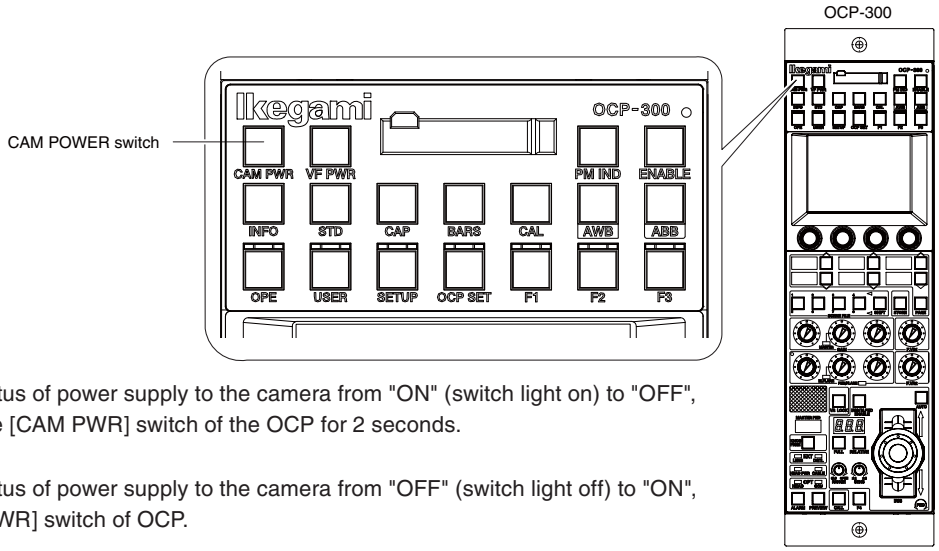
When the camera self-diagnostic function detects errors, the ALARM indicator flashes, and the self-diagnosis information will be displayed for 20 seconds on the MON output.



Caution:

The self diagnostic information is not displayed on the PM unless the PM IND of the OCP is set to "ON".

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



1 To change the status of power supply to the camera from "ON" (switch light on) to "OFF", press and hold the [CAM PWR] switch of the OCP for 2 seconds.

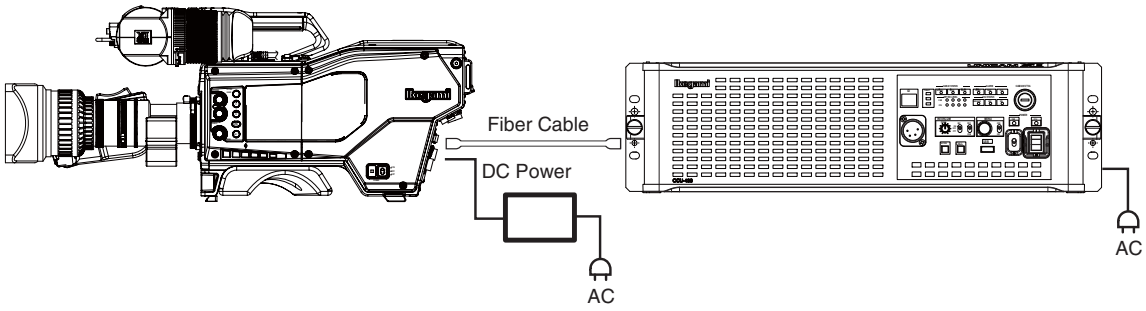
2 To change the status of power supply to the camera from "OFF" (switch light off) to "ON", press the [CAM PWR] switch of OCP.

Note:

Function will change according to the control panel to be used.

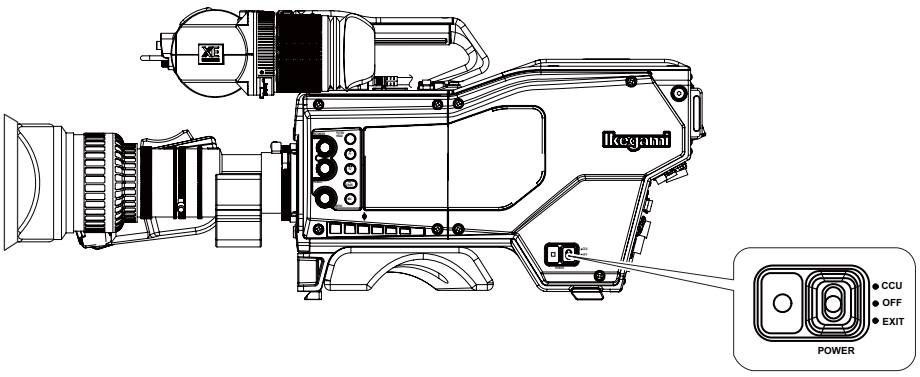
Activating the FIBER SINGLE MODE

The FIBER SINGLE MODE is used to extend the transmission distance between the camera and CCU or in applications where single mode fibers are available. The transmission distance is determined by the power loss and the attenuation of the light. If the power loss is too great, power needs to be supplied to the camera with a separate power source . When the FIBER SINGLE MODE is set to ON, the power will not be supplied from CCU, but two-way optical transmission is operable as usual.
The camera and CCU needs to be set individually to operate in FIBER SINGLE MODE, The following describes the setting method. This product can be extended on up to 10 km of SM fiber.



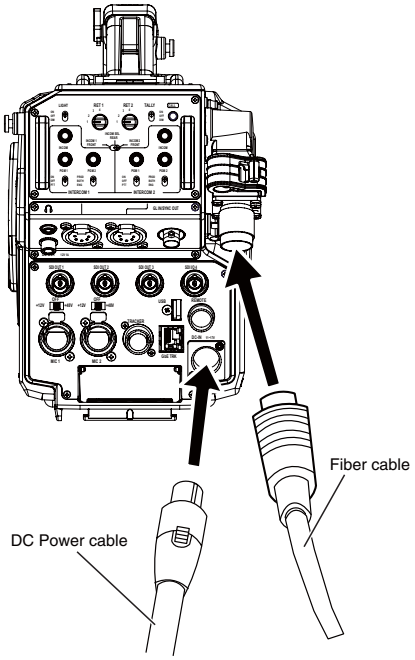
1 Set the output voltage of the external power supply to +12V (Supply voltage range: +11 to 17V).

2 Turn the POWER switch to the "OFF" position.



3 Connect the connector from an external power supply to the DC IN connector on the back of the camera.

Connect the camera cable from CCU to the camera connector on the back of the camera.



4 Turn on the CCU power supply.

5 Turn on "FIBER SINGLE MODE" in the CCU Menu setting.

Reference:

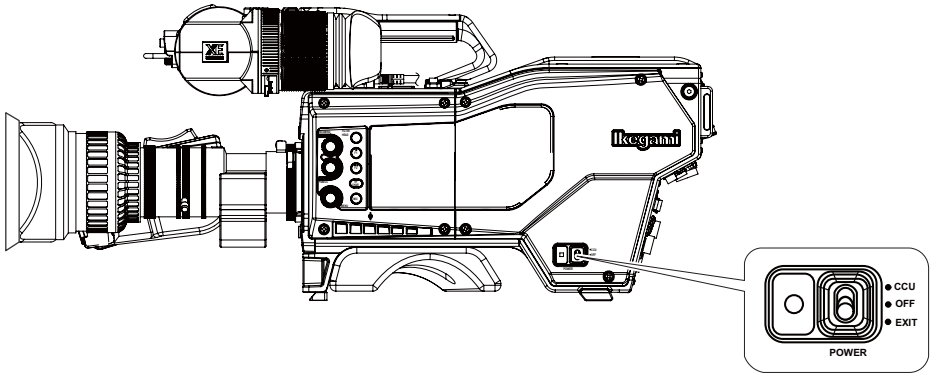
Please refer to **"6.1 Basic Operation of Menu Screen" (P. 131)** and **"6.2 CCU Menu Configuration and Contents", "Setting the SYSTEM SETTING (2/2)", "CONFIGURATION" (P. 143)** for the setting of "FIBER SINGLE MODE".

6 Turn on the camera power switch of the CCU side.

7 Turn on the external power switch.

8 Turn the POWER switch on the right side of the camera to the "EXT" postion.

Turn on "FIBER SINGLE MODE" in the CAMERA Engineer Menu setting.



4.4 Output Signal Check

After turning ON the power, ensure that signals are correctly output on the PM and WFM. If the video signals are not output refer to Chapter 8 and check the following points before determining that it is a device failure.

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

Reference:

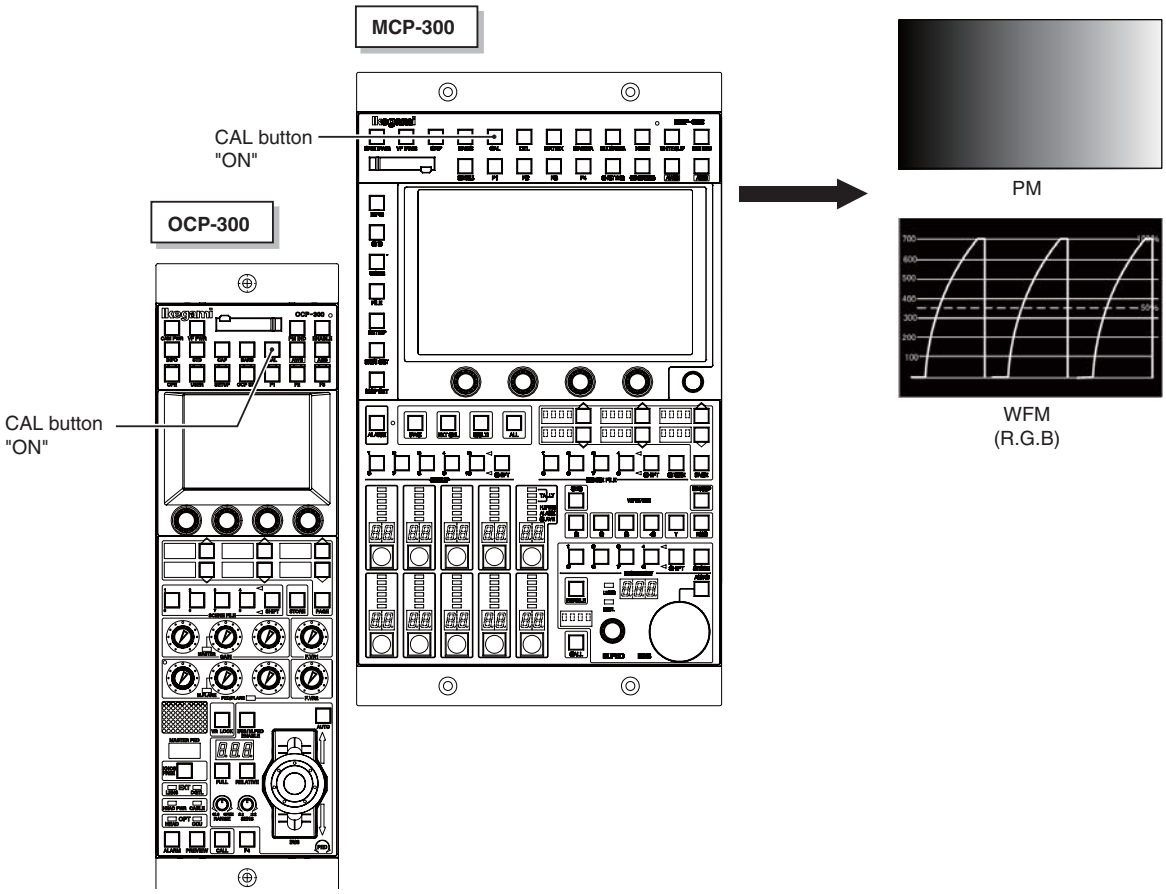
See **"Chapter 3 : INSTALLATION and CONNECTION" (P. 35)** for connection of peripheral equipment.

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.

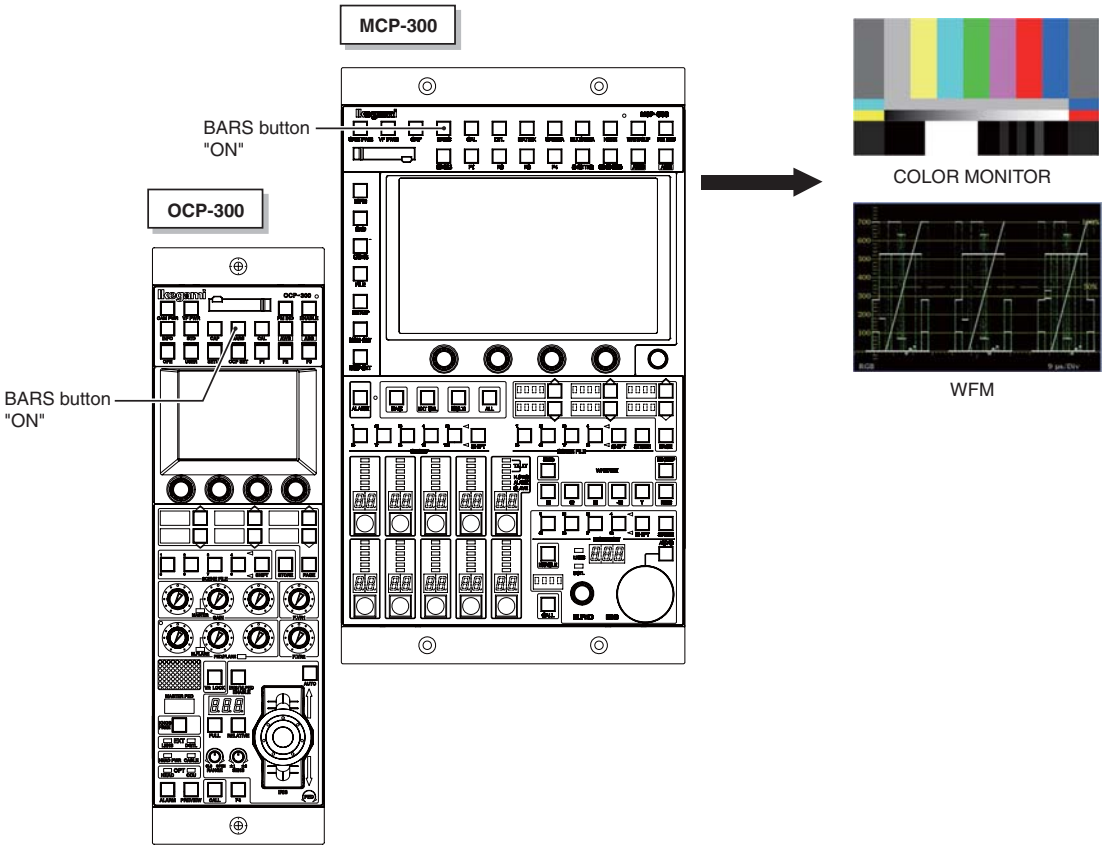
2 Check if a test signal with 100% level is output to the R, G, and B channels on the waveform monitor.



Color-Bar Signal Check

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

Check a normal color bar signals is are output on the output lines.

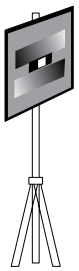


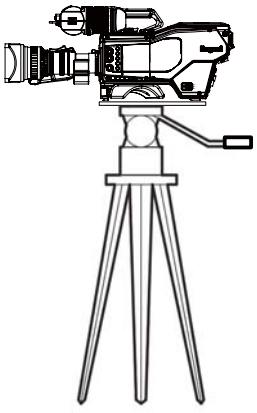
External Chart Check

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

1 Shoot external charts including grayscale.

2 Check video signals for abnormality on the waveform monitor (WFM) and picture monitor (PM).





4.5 Viewfinder Adjustment (VFL201D)

To make the video quality of the viewfinder picture clear, adjust the viewfinder according to your operating environment. This edition of the manual explains the case where the VFL201D is used.

Reference:

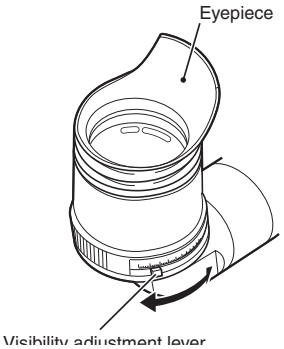
Please refer to **"Chapter 3 : INSTALLATION and CONNECTION" "Mounting and Removing the Viewfinder" (P. 44)** for the adjustment of the viewfinder positions and angles.

Visibility and Screen Adjustments of the Viewfinder

■ *Visibility adjustment*

The focus of the viewfinder is adjusted according to the cameraman's eyesight.

1 While pressing the diopter adjustment lever of the viewfinder, slide it in the direction of the arrow for best focus .

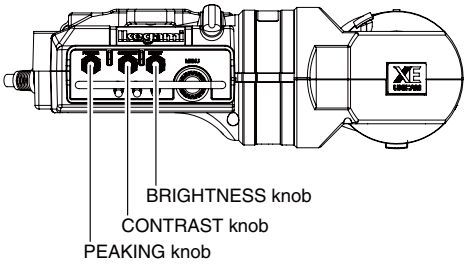


■ *Screen adjustment*

Adjust the picture quality of the viewfinder screen.

1 Adjust each control knob on the viewfinder.

- PEAKING knob : Adjusts the sharpness of the image.
- CONTRAST knob : Adjusts the contrast of the image.
- BRIGHTNESS knob : Adjusts the brightness of the image.



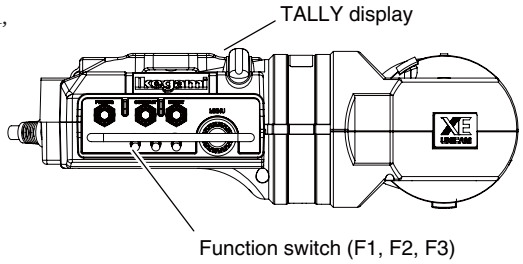
Checking the Display Mode of the Viewfinder

Various marker and character displays in the viewfinder screen can be set. The display mode is set according to the usage situation.

■ *Viewfinder (VFL201D) switch*

The functions of the following items are assigned to the function switch (F1, F2, F3) of the viewfinder from the Menu.

- MONO : Sets the VF picture to black and white screen.
- TALLY : TALLY display
- USRMAKER : For checking framing
- WFM : Video waveform display
- VSC : Vector screen display
- ZOOM IND : Zoom position of lens
- ZEBRA : Video level indication
- PEAK-UP : Enhance the sharpness of the viewfinder picture .



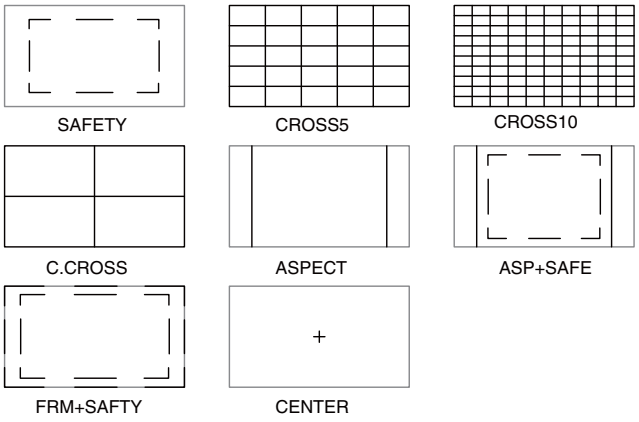
Reference:

The settings of Display mode is performed on the Menu screen. Please refer to **"Chapter 5 : CAMERA SETTINGS and ADJUSTMENT" "5.3 Menu Configuration and content" (P. 86)** for more information.

Viewfinder Marker Display Settings

Various markers are available for the viewfinder.
Use the Menu screen to select and turn on/off the markers On and Off.

■ *Marker types*



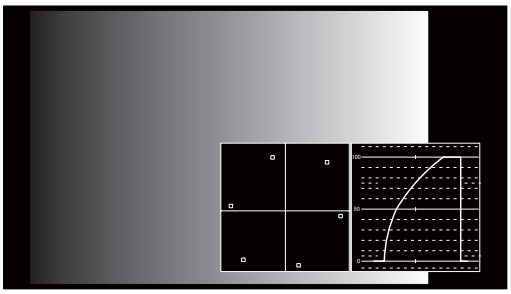
- Frame marker
  Select "16:9", "13:9" or "4:3".
- Safety marker
  Select the "ACTION MARKER" or "TITLE MARKER".
  You can set the marker position.
- Cross marker
  Select the "C.CROOSS", "CROSS5" or "CROSS10".
- Aspect marker
  Select "13:9", "14:9" or "15:9".
- Center marker
  Select "TYPE1", "TYPE2" or "TYPE3".

Center marker types

Display the Waveform Video and Vector Video in the Viewfinder

The viewfinder can display waveform monitoring (wave monitor) images and color monitoring (vector scope) images as supporting functions.

The position, brightness, and display colors of the monitoring images can be set in the Menu setting screen.



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 and CCU.

■ *Auto Setup function*

(1) FULL auto setup
Executes all auto setup items in the camera. This is mainly executed after maintenance and inspection. The auto setup chart is required.

(2) LEVEL auto setup
Set the video processing levels. This process can be executed daily before using the camera. The auto setup chart is required.

(3) FULL QUICK auto setup
Because the FULL 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.

(4) QUICK auto setup
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.

(5) 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.

(6) 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.

■ *Auto Setup Function List*

Control Item	Auto Setup Function					
	FULL	LEVEL	FULL QUICK	QUICK	AWB	ABB
REF	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
PED	R, G, B	R, G, B	R, G, B	R, G, B		R, G, B
GAIN	R, ■G, B	R, ■G, B	R, G, B	R, G, B	R, B	
GAMMA	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		
WHITE CLIP	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		
POINT	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		
POINT	R, G, B	R, G, B	R, G, B	R, G, B		
WHITE SHADE						
H SAW	R, ■G, B					
H PARA	R, ■G, B					
V SAW	R, ■G, B					
V PARA	R, ■G, B					
CAL × 100 (GAIN, PED)	R, G, B		R, G, B			R, G, B

Reference:

- INT (internal reference) REF is the factory setting value by software.
- EXT (external reference) REF is the value set by the reference set function.
- The items for the G channel with a black square only works when it is set with a diascope (lens option). When you use an external chart, set the G manually.

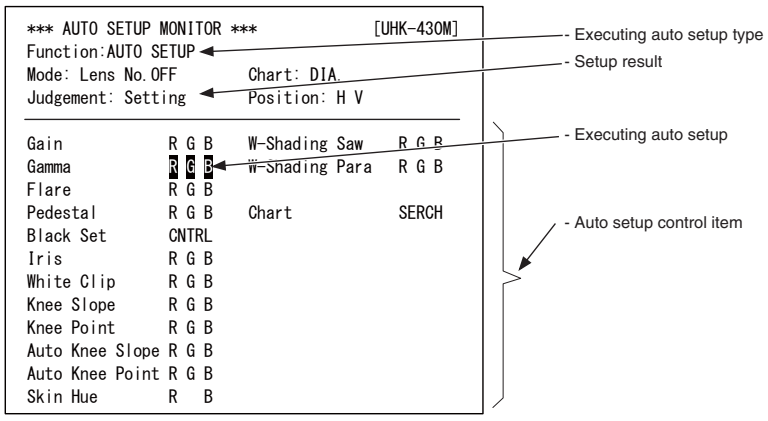
■ *Auto Setup Screen*

When various auto setup functions execute, the status is displayed in the viewfinder and on the PM output. The currently executing item is indicated by the cursor.

Note:

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*

The FULL auto setup can be activated from the camera menu, CCU front side, 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” from the camera menu “AUTO SETUP MODE” - “AUTO SETUP”.

Note:

To perform the FULL Auto Setup from OCP or MCP, align the ND FILETR and COLOR FILTER to the light source, then follow the next procedures.
1. Press the SETUP button in the function switch part.
2. Press the AUTO SETUP button on the LCD.
3. Press the Full button on the LCD.
4. Press the Start button on the LCD.

■ *LEVEL Auto Setup*

The LEVEL auto setup can be activated from the camera menu, CCU front side, 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 “LEVEL” from the camera menu “AUTO SETUP MODE” - “AUTO SETUP”.

Note:

To perform the LEVEL Auto Setup from OCP or MCP, align the ND FILETR and COLOR FILTER to the light source, then follow the next procedures.
1. Press the SETUP button in the function switch part.
2. Press the AUTO SETUP button on the LCD.
3. Press the Level button on the LCD.
4. Press the Start button on the LCD.

■ *FULL QUICK Auto Setup*

The FULL QUICK auto setup can be activated from the camera menu, CCU front side, OCP, or MCP. To perform the FULL 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 button on the LCD.

4 Press the Start button on the LCD.

■ *QUICK Auto Setup*

Select “QUICK” from the camera menu “AUTO SETUP MODE” - “AUTO SETUP”. To perform the 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 Quick button on the LCD.

4 Press the Start button on the LCD.

■ *Auto White Balance*

The auto white balance can be performed from camera or CCU front menu operation display and from the OCP or MCP. This section explains how to perform auto white balance from the OCP.

1 Select a memory to save execution results of auto white balance using the AWB selector switch.

There are two memories (Ach and Bch). Use two separate white balance values as needed.

A : Selects Ach memory.
B : Selects Bch memory.
OFF : The white balance correction is preset (3200K). In this status, AWB cannot be performed.

Note:

The previously saved data will be overwritten.

2 Selects color filter and ND filter according to the light source.

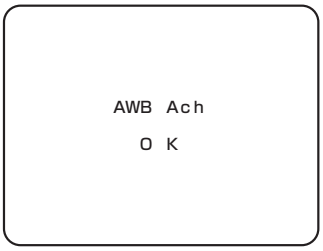
3 Shoot the subject which contains white color.

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

4 Press the AWB switch on the camera function operation panel of OCP to perform the auto white balance.

5 Check the results.

"OK" or "NG" will be displayed on the picture monitor or 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.

Note:

Press "AWB" on the LCD section to perform it from MCP.

■ *Auto Black Balance*

The auto black balance can be performed from the camera or the CCU front menu operation control and from the OCP or the MCP. This section explains how to perform auto black balance from the OCP.

1 Press the ABB switch on the OCP.

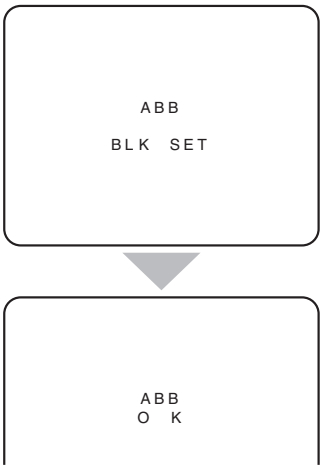
The status is automatically changed to the CAP status and then the auto black balance will be performed.

2 Check the results.

When the auto black balance is complete, "OK" or "NG" is displayed on the PM (Picture Monitor) screen or the viewfinder screen.

Caution:

Be sure to set the R/G/B PED 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.



4.7 Preparation for Shooting in Particular Environments

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*

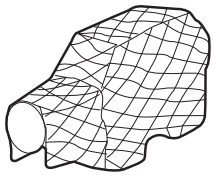
Check the lubricants are intended for cold districts in advance. Otherwise the movement of the tripod, focus, zoom, and iris will become heavy. Put a cold-weather cover on the camera, and fully warm up the camera before using it.

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

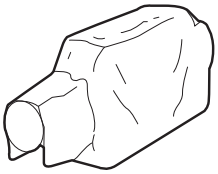
The camera is designed to resist dust and rain. However, when shooting in a dusty place or in the rain, put a dust cover or a rain cover on the camera.

■ *Shooting where the electromagnetic field is strong*

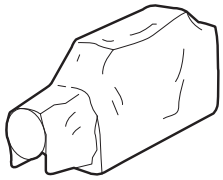
When shooting where the electromagnetic field is excessively strong, such as in airports, military bases or transmitting stations, shield the camera by covering it an RFI resistant cover



Cold-weather cover



Dust cover



Rain cover

4.8 Scene File

■ *Save condition of a UHK-430 scene file*

Item	Save Data	
GAIN	-6dB to +12dB	
GAMMA	OFF/0.35/0.40/0.45	
GAMMA TYPE	NORMAL, CINE1 to 2, CUSTOM1 to 5	
FLARE	ON/OFF	
KNEE	ON/OFF	
AUTO KNEE	ON/OFF	
WHITE CLIP	ON/OFF	
DTL	ON/OFF	
HARD DTL (SOFT DTL OFF)	ON/OFF	
SKIN DTL	ON/OFF	
MATRIX	OFF/MTX1 to 3	
PRESET SHUTTER	OFF, 1/100 to 1/2000	
VARIABLE SHUTTER	ON/OFF	
BLACK STRECH	OFF/-11% to +11%	
ND FILTER	ND1 to ND5	
CC FILTER	CC A to CC E	
COLOR SAT	ON/OFF	
WHT Shade	ON/OFF	
COLOR DTL	ON/OFF	
COLOR CORRECT	ON/OFF	
SUPER KNEE	OFF/LOW/MID/HIGH	
HI-LIGHT DTL	ON/OFF	
SMOOTH KNEE	OFF/TYPE1 to TYPE3	
ZOOM DTL	ON/OFF	
ZOOM SKIN DTL	ON/OFF	
VARIABLE C.TMEP	ON/OFF	

■ *UHK-430 Scene File Saving Item*

The operation of scene files is performed using OCP. Please refer to “OCP-300 Operation Manual” for instructions on how to operate switches and save the files to memory cards.

CAMERA SETTINGS and ADJUSTMENT

5

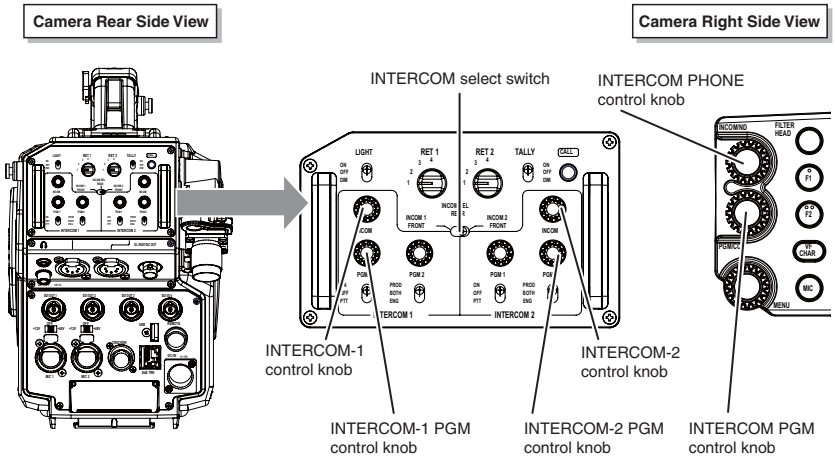
5.1 Adjusting INTERCOM

Adjusting Headset Volume

This section explains how to adjust the headsets volume.

Caution:

Do not set the INTERCOM-1 control knob, INTERCOM-2 control knob, INTERCOM-1 PGM-1/2 control knob, and INTERCOM-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 Receiver Volume*

The volume of intercom receiver is adjusted using knobs on the back side and the right side of the camera.
If using the knob on the back side of the camera, follow Procedure 2, or if using the knob on the right side of the camera, follow Procedure 3, 4, and 5

- Adjust the INTERCOM volume on the back side of the camera.

1 Set the INTERCOM FRONT VR selector switch to "REAR".

2 Turn the INTERCOM-1 control knob and the INTERCOM-2 control knob on the back side of the camera to adjust the volume.

- Adjust the INTERCOM volume on the side of the camera.

3 Set the INTERCOM switch to "INTERCOM1 FRONT" or "INTERCOM2 FRONT".

4 Cancel the operation right on the ND and the camera of the color filter. (The "*" mark is not displayed on the VF screen.).

5 Turn the INTERCOM PHONE control knob on the right side 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 volume of intercom receiver is adjusted using knobs on the back side and the right side of the camera.
If using the knob on the back side of the camera, follow Procedure 2, or if using the knob on the right side of the camera, follow Procedure 3, 4, and 5

- Adjust the INTERCOM PGM volume on the back side of the camera.

1 Set the INTERCOM selector switch to "REAR".

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

3 Turn the INTERCOM-1 PGM control knob and the INTERCOM-2 PGM control knob on the back side of the camera to adjust the volume.

- Adjust the INTERCOM PGM volume on the side of the camera.

4 Set the INTERCOM selector switch to "INTERCOM1 FRONT" or "INTERCOM2 FRONT".

5 Set the PGM lines of the intercom system using the INTERCOM-1 PGM-1/PGM-2 switch and INTERCOM-2 PGM-1/PGM-2 switch on the back side of the camera.

Note:

If the INTERCOM selector switch is set to FRONT, you can make either PGM-1 or PGM-2 controllable from FRONT on the Menu screen using "INTERCOM AUDIO", "INTERCOM FUNCTION", and "PGM FRONT VR". It is set to PGM-1 by default.

6 Push the INTERCOM selector switch on the back side of the camera to the "INTERCOM-1" or "INTERCOM-2" side.

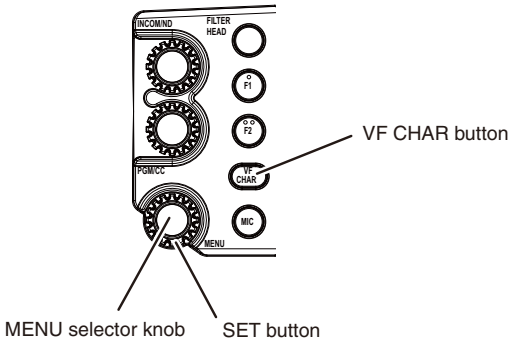
7 Turn the INTERCOM PGM control knob on the right side of the camera to adjust the volume.

Caution:

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

5.2 Basic Operation of the Menu

Various setting items through the Menu screen are displayed on the VF (viewfinder), and various camera functions can be arbitrarily set. Select and set various items while looking at the Main Menu screen and Sub Menu screen displayed on VF. The menu has a hierarchical structure. It includes the User menu, Main menu, and Engineer menu.



Caution:

MENU selector knob : Used to select a setting item in various settings of camera functions.
SET button : Press this button to confirm the selection and settings in various settings of camera functions.
VF CHAR button : Displays various information on the VF screen.

Caution

The menu setting items are displayed on the camera in the above operation, the menu items of the camera are displayed, but not the CCU menu items. Please refer to Chapter 6 for the CCU menu setting items.

Operation of the menu screen

■ *Displaying User Menu Screen*

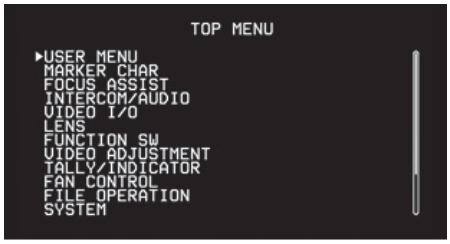
Press the SET button for 0.5 seconds to display the user menu.

■ *Displaying Normal Menu Screen (Main Menu Screen)*

Simultaneously press the VF CHR button and the SET button to display.

■ *Menu Setting Screen*

Each setting item on the menu screen has a hierarchical structure.
The setting items are also classified into user setting item and engineer setting item.
- User setting item : Daily operation item
- Engineer setting item : Regular maintenance item by user



Menu screen example

Caution

(1) The main menu screen is indicated as "TOP MENU" in this manual.
(2) Various setting items and setting value select screen are indicated as sub menu screen.

■ *Displaying the Main Menu*

Follow the instructions below to display the menu.

1 Press the "VF CHAR" switch and SET button on the right side of the camera for simultaneous to display the main menu screen of MAIN MENU (TO MENU).

2 Turn the menu select knob in the menu on the right side of the camera to move the cursor mark of the main menu screen to the setting item.

Then, the item where the cursor was moved to flashes.

3 Press the "SET button" on the right side of the camera to change the screen to the sub menu screen of the setting item selected.

In this example, the screen was changed to the sub menu screen of "VIDEO I/O".

4 Turn the menu select knob in the menu on the right side of the camera to move the cursor mark of the sub menu screen to the setting item. Then, the item where the cursor was moved to flashes.

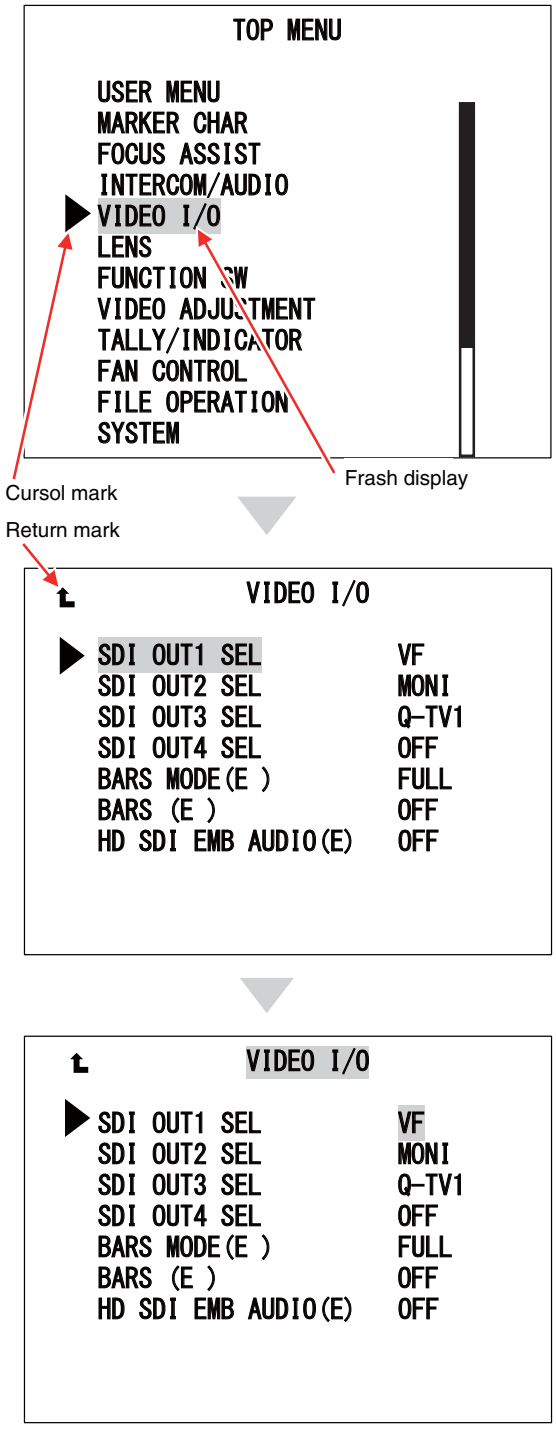
5 Press "SET button" on the right side of the camera, then the setting value of the setting item flashes. Turn the menu select knob to change the setting value.

[Example]

→ VF → MAIN → RETURN ┐

6 Press "SET button" when the desirable setting value is displayed to confirm it. When the setting value is confirmed, the screen is returned to the sub main menu.

7 To return to the main menu half way through the setting, move "cursor mark" to "return mark" and press "SET button



Caution:

If you do not press the SET button after changing the mode setting, the change may be effective.

Note:

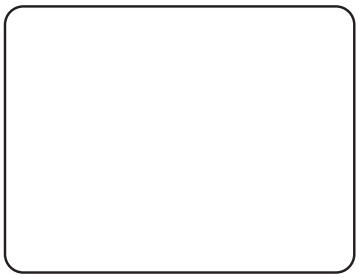
- Select "↵" and press the SET button to return to the main menu.
- The pages of the "top menu screen" and "sub menu screen" with multiple items are changed directly with their cursor marks.
- The "menu select knob" and "SET button" on the right side of the camera and the same switch and button on the viewfinder can be used.

■ *Exiting the Menu*

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

1 Press the VF CHAR button on the right side of the camera.

Exit the main menu screen/sub menu screen.



About USER MENU

The operation items frequently used in daily operation are registered in "USER MENU", so the setting screen can be displayed with a quick operation.
The initial values, customization, transfer, and deletion of USER MENU are described.

■ *Initial Values of USER MENU*

The factory settings of USER MENU include the following items.

- MARKER CHAR
- FOCUS ASSIST
- INTERCOM/AUDIO
- VIDEO I/O
- FUNCTION SW
- TALLY/INDICATOR
- INFORMATION

■ *Displays the USER MENU*

"USER MENU" can be displayed in two ways.
(1) Select it from "MAIN MENU (TOP MENU)" to display.
(2) Press and hold the SET button for 0.5 seconds to display.

■ *Customizing the USER MENU*

Up to 20 items can be registered in USER MENU. Perform the following procedures to register:

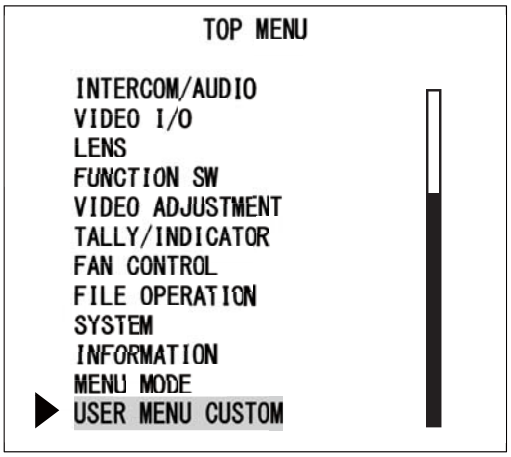
1 Select [USER MENU CUSTOM] from "MAIN MENU (TOP MENU)".

2 When the numbers from 1 to 20 (includes scrolled area) are displayed, move the cursor to the number you wish to register and press the SET button.

3 When [SELECT], [MOVE], [DELETE], and [CANCEL] are displayed, move the cursor to [SELECT] and press the SET button.

4 When the list of the TOP MENU items are displayed, move the cursor to select the number (item) you wish to register.

The selectable items are going to flash when the cursor is moved over the items.



5 If the selected item has sub items, [SET], [EXPAND], and [CANCEL] are displayed.

Select [SET] to register the selected menu item in the USER MENU.
Select [EXPAND] to expand the selected menu item.
When the menu list is displayed, select items from among them.

6 If there are no sub items under the selected item or the item cannot be expanded (the lowermost item), the item is registered as it is.

7 If you wish to continue to register, repeat the procedures (2) to (5) or (6).

■ *Moving in the USER MENU*

Perform the following procedures to move the registered menu items to another number:

1 Select [USER MENU CUSTOM] from "MAIN MENU (TOP MENU)".

2 When the numbers from 1 to 20 (includes scrolled area) are displayed, move the cursor to the number (item) you wish to move and press the SET button.

3 When [SELECT], [MOVE], [DELETE], and [CANCEL] are displayed, move the cursor to [MOVE] and press the SET button.

4 When the list of the destinations that items are moved to is displayed, move the cursor and press the SET button.

The item is going to be moved.

5 If there are more items to move, repeat the procedures (2) to (4).

Caution:

If the registered items already exist in the destination that items are moved to, they will be overwritten, therefore; they cannot be retrieved.
The items in the original location will be blank. (This action only moves items, not replace them.)
For example, [A] and [B] are registered in No.1 and 2 respectively. If the item in No.1 is moved ([MOVE]) to No.2, the item in No.1 becomes blank and the No.2 becomes [A].

■ *Deleting the USER MENU*

Perform the following procedures to delete the registered menu items:

1 Select [USER MENU CUSTOM] from "TOP MENU".

2 When the numbers from 1 to 20 (includes scrolled area) are displayed, move the cursor to the number (item) you wish to delete and press the SET button.

3 When [SELECT], [MOVE], [DELETE], and [CANCEL] are displayed, move the cursor to [DELETE] and press the SET button.

4 If there are more items to move, repeat the procedures (2) and (3).

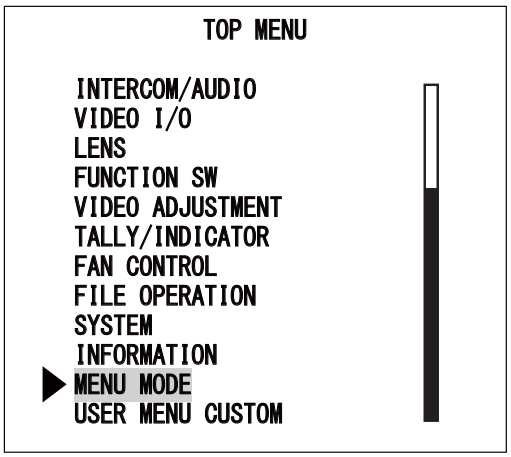
Displaying ENGINEER MENU

Perform the following procedures to display the [ENGINEER MENU] items.

1 Move the cursor from [MAIN MENU (TOP MENU)] to [MENU MODE], and press the SET button.

2 When the [ENGINEER MENU] ON/OFF setting screen is displayed, move the cursor to [ON] and press the SET button.

3 [MAIN MENU (TOP MENU)] is displayed. Add and the items to be set in [ENGINEER MENU] to the normal [TOP MENU] items to display.



Caution:

- The settings of [ENGINEER MENU] are reset to [OFF] when the power is turned off and restarted. So, set the [ENGINEER MENU] to [ON] to display the engineer menu again.
- The menu items marked with "(E)" at the end are the [ENGINEER MENU] items.

5.3 Menu Configuration and content

Various setting items performed on the camera side are displayed.

■ *Sub Menu Setting Items*

(1) USER MENU
Sets the items used in daily operation. (Items regarding maintenance and inspection are not included.)
- MARKER CHAR
- VF VIDEO SETTING
- TALLY/INDICATOR
- FOCUS ASSIST
- INTERCOM/AUDIO
- FUNCTION SW
- SYSTEM
- LENS
- INFORMATION
- USER MENU CUSTOM

Please refer to **"5.2 Basic Operation of the Menu" "About USER MENU" (P. 83)** for more information of the USER MENU.

(2) MARKER CHAR
Sets the function used to support a camera man with displays of various markers on the viewfinder during shooting.

(3) FOCUS ASSIST
A function used to set the highlight of the viewfinder video signals, etc. and support a camera man during shooting.

(4) INTERCOM/AUDIO
Performs various settings according to the operation of intercom and audio.

(5) VIDEO I/O
Sets the input/output video signals of the camera.

(6) LENS
Sets the information required to set lens irises and create lens files.

(7) FUNCTION SW
Sets the function switches of the camera and viewfinder.

(8) VIDEO ADJUSTMENT
Performs various condition settings required for video signal processing and auto setup.

(9) TALLY/INDICATOR
Sets TALLY display and the condition settings for ZEBRA display.

(10) FAN CONTROL
Sets the operating conditions of air cooling fans built in the camera and viewfinder.

(11) FILE OPERATION
Saves and sets various data using USB memory.

(12) SYSTEM
Sets the basic operation of the camera.

(13) INFORMATION
Provides the operation state of the camera.

(14) MENU MODE
Displays the setting mode of the menu.

(15) F MENU (exclusive use)
Introduces the setting menu of the viewfinder. Please refer to the operation manual of your viewfinder for more details.

Caution:

Some of operations may be different from this manual due to improvements. Please note that some of operations may be different from this manual due to improvements.

■ *MARKER CHRACTER(MARKER CHAR)*

A function used to support a camera man with displays of various markers on the viewfinder during shooting.

Menu Item	Initial setting	Setting value	Description, Remarks
MARKER CHAR			
DISPLAY MODE	2	OFF, 1, 2	1 : Markers are always displayed. Character-related items are displayed for 2 seconds when functions are operated and when parameters are changed. 2 : Markers and characters are always displayed. OFF : Markers and characters are always turned off and only warning messages are displayed.
MARKER/CHAR LVL	100	1 to 100	Sets the level for markers and characters. The line gets darker towards the direction of "1".
CHARACTER SETTING			The screen switches to another screen, and individually turn on/off the characters.
MARKER SETTING			
FRAME MARKER	OFF	ON-16:9, ON-14:9, ON-13:9, ON-4:3, OFF	Sets the ON/OFF state of the frame markers and the size (aspect ratio).
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 ON/OFF state of the safety markers and the size (aspect ratio).
SIDE MASK	OFF	OFF,ON-14:9, ON-14:9, ON-4:3	Sets the side mask.
CONTRAST	50	0 - 100	Adjusts the side mask contrast level.
BRIGHT	60	0 - 100	Adjusts the side mask brightness level.
CENTER MARKER	TYPE1	OFF,TYPE1, TYPE2,TYPE3	Sets the center marker. OFF: Turns off the center marker. TYPE1: Marker with blank at the center. TYPE2: Marker (Large) with lines crossing at the center. TYPE3: Marker (Small) with lines crossing at the center.
MARKER ON/ OFF[VF]	OFF	OFF, ON	Sets the ON/OFF of the marker display.
MARKER SELECT [VF]	SAFETY	SAFETY, FRM+SAFE, ASP+SAFE, ASPECT, C.CROSS, CROSS10, CROSS5	Sets the marker types
CENTER MARKER [VF]	OFF	OFF, TYPE-A, TYPE-B	Sets the ON/OFF of the center marker display.
ASPECT MARKER [VF]	4:3	4:3,13:9,14:9,15:9	Sets the aspect marker types.
SAFETY MARKER [VF]	80%	80% to 100%	Sets the safety markers "80 - 100100% (1% increments)".
SHADOW MODE [VF]	OFF	OFF, SHADOW, MRK+SHD	Sets the shadow of the safety markers or aspect markers.
SHADOW LEVEL [VF]	60%	20%,40%,60%	Sets the shadow level.
MARKER COLOR [VF]	WHITE	WHITE, YELLOW, RED, BLUE, GREEN, CYAN, MAGENTA	Sets the marker display color.
MARKER LEVEL [VF]	60%	20%, 40%, 60%, 80%, 100%	Sets the marker display level.
USER MARKER [VF]	OFF	OFF, ON	Sets the ON/OFF of the user marker display.
MARKER LEVEL [VF]	60%	20%, 40%, 60%, 80%, 100%	Sets the user marker display level.
SCENE SELECT [VF]	SCENE1	SCENE1 - SCENE5	Sets 5 types of scenes.

■ *FOCUS ASSIST*

A function used to set the highlight of the viewfinder video signals, etc. and support a camera man during shooting.

[VF PEAKING & VFVIDEO SETTING]

Menu Item	Initial setting	Setting value	Description, Remarks
VF PEAKING[VF]			
PEAKING [VF]	OFF	ON, OFF	Sets the ON/OFF of PEAKING on the VF screen.
PEAKING MODE [VF]	H&V	H&V, H-ONLY	Sets the edge mode of PEAKING.
PEAKING WIDTH [VF]	1	1 - 4	Sets the edge width of PEAKING.
NOISE SUP [VF]	0	0 - 9	Sets the removal level of the noise signals.
PEAKING UP [VF]	OFF	OFF,X2,X4,X8	Sets the PEAKING level (x2/x4/x8).
ZOOMUP PEAKING [VF]	OFF	ON, OFF	Sets the ON/OFF of PEAKING corresponding to the ZOOM ratio of the camera lens.
ZOOMUP PEAK-MAX [VF]	100	MIN - 100(1step)	Sets the maximum Tele side value of ZOOMUP PEAKING.
ZOOMUP PEAK-MIN [VF]	0	0 - MAX(1step)	Sets the minimum Wide side value of ZOOMUP PEAKING.
COLOR PEAKING [VF]	WHITE	WHITE, YELLOW, RED, BLUE, GREEN	Gives colors to PEAKING of the VF video.
VIDEO MAG [VF]	X2	X2,X4,X8	Sets the display settings of the VF screen magnification function.
MAG. TIMER [VF]	OFF	OFF, 1 - 7sec	Sets the display time of the VF screen magnification function.
VF VIDEO SETTING			
COLOR/MONO [VF]	COLOR	COLOR,MONO	Switches between COLOR/MONO for the VF screen.
VIDEO SELECT	R/G/B	Y,R+G+B, R,G,B,R/G/B	Sets the video signals to change the VF screen to MONO display.
DTL	35	0 - 100 continuously variable	Sets the outline correction level in the VF screen.
BOOST FREQ.	10MHz	10MHz, 15MHz, 18MHz, 18MHz, WIDTH	Sets the outline correction highlight horizontal frequency in the VF screen.
NOISE SUP.	3	0 - 100 continuously variable	Sets the noise removal level during outline correction in the VF screen.
CAPTURE DISPLAY [VF]	OFF	OFF,ON	Performs a capture of the VF display screen.
DISP.INTERVAL [VF]	1FRAME	1,2,3,5,10, 30,60 frame	Sets the display interval of the VF screen display.
GAMMA SELECT [VF]	GAMMA 2.2	GAMMA 1.4,1.8,2.2,2.6,3.0	Sets the gamma curve of video signals that are displayed on the VF screen.
PICTURE-IN-PICTURE	––	––	––
PIP ON/OFF	OFF	OFF,ON	Switches between ON/OFF of PINP.
POSITION	LOW-R	LOW-R, LOW-L, UPL, UP-R	Sets the display position of the child screen.
SIZE	1/5	1/5,1/4,1/3, 1/1	Sets the size of child screen (size ratio against parent screen).
BORDER MARKER	OFF	OFF,ON	Sets the mix ratio of child screen and parent screen. Displays child screen only in the child screen area with a ratio of 100.
FADE RATIO	100	0 to 100	Sets the mix ratio of child screen and parent screen. Displays child screen only in the child screen area with a ratio of 100.
PICTURE-IN-PICTURE [VF]			Set ON/OFF and position of PINP.
CHROMA UP [VF]	OFF	OFF, ON	Sets ON/OFF of the function that increases the color strength of the VF video.

<< FOCUS ASSIST continues to the next page >>

[FOCUS ASSIST WINDOW]

<< FOCUS ASSIST continued >>

Menu Item	Initial setting	Setting value	Description, Remarks
FOCUS ASSIST WINDOW			
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, LENS VTR	Trigger to display ASSIST AREA. This setting is used when TRIGGER ON is selected.
AREA ON/OFF SW	NONE	LENS VTR, NONE	Selects the switch that turns on/off the ASSIST AREA.
VF VIDEO MAG.	UNLINK	LINK, UNLINK	Sets whether to send control signals of VF VIDEO MAG function to VF or not.
ASSIST DATA	NO.1	N0.1 - N0.4	Selects the ASSIST DATA compiled in the ASSIST DATA SETTING menu.
ASSIST DATA SETTING			
SW ACTION	ALTERNATE	ALTERNATE, MOMENTARY	Sets the SW operation to MOMENTARY or ALTERNATE when the trigger is assigned to LENS VTR SW.
AREA DISP TIME	1.0S	0.0S - 5.0S (0.5 sec interval)	Sets the time from trigger detection until the focus assist area is erased.
AREA SIZE	15	1 - 100	Sets the focus assist area range. If set to “100", it is the entire screen domain.
AREA LEVEL	60%	25% - 100%	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 - 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 - 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.

■ *INTERCOM/AUDIO*

Performs various settings according to the operation of intercom and audio.

[MIC GAIN CONTROL]

Menu Item	Initial setting	Setting value	Description, Remarks
MIC GAIN CONTROL			
MIC1 SETUP			
MIC1 SETUP SELECT	MIC	MIC / LINE	Sets the microphone mode. The power is supplied according to the MIC-1 POWER switch on the back side of the camera during the MIC setting. The power supply is stopped regardless of the MIC-1 POWER switch on the back side of the camera during the LINE setting.
MIC1 STEP	-40dB	+4dB, 0dB, -10dB,-20dB, -30dB, -40dB, -50dB, -60dB	The MIC1 gain is changed step by step.
MIC1 FINE	0	-100 to100	Fine adjustment of the MIC1 gain. The gain decreases about -10 dB with -100, and increases about +10 dB with +100.
MIC2 SETUP			
MIC2 SETUP SELECT	MIC	MIC / LINE	Sets the microphone mode. The power is supplied according to the MIC-2 POWER switch on the back side of the camera during the MIC setting. The power supply is stopped regardless of the MIC-2 POWER switch on the back side of the camera during the LINE setting.
MIC2 STEP	-40dB	+4dB, 0dB, -10dB,-20dB, -30dB, -40dB, -50dB, -60dB	The MIC2 gain is changed stepwise.
MIC2 FINE	0	-100 to100	Fine adjustment of the MIC2 gain. The gain decreases about -10 dB with -100, and increases about +10 dB with +100.

<< INTERCOM/AUDIO continues to the next page >>

[INTERCOM SET UP (1/3)]

[HEADSET MIC]

Menu Item	Initial setting	Setting value	Description, Remarks
HEADSET SET MIC			
INTERCOM1			
MIC TYPE	DYNAMIC	CARBON, DYNAMIC	Selects carbon or dynamic for INTERCOM1 microphone.
POWER	ON	ON, OFF	Sets the ON/OFF of power supply to the carbon microphone. (Fixed to "OFF" when Dynamic MIC is selected.)
GAIN	-60dB	-60dB /-50dB /-40dB/-20dB /-10dB / 0dB	Changes the microphone gain of INTERCOM1 by step.
FINE	0	-100 - 100	Fine adjustment of the INTERCOM1 gain. The gain decreases about -10 dB with "-100", and increases about +10 dB with "+100".
UNBAL	OFF	OFF / ON	Selects the balance/unbalance mode. Can select ON/OFF for dynamic microphone setting, and fixed to ON for the carbon microphone.
INTERCOM2			
MIC TYPE	DYNAMIC	CARBON, DYNAMIC	Selects carbon or dynamic for INTERCOM2 microphone.
POWER	ON	ON, OFF	Sets the ON/OFF of power supply to the carbon microphone. (Fixed to "OFF" when Dynamic MIC is selected.)
GAIN	NORMAL	NORMAL, HI	Changes the microphone gain of INTERCOM2 by step.
FINE	0	-100 to 100	Fine adjustment of the INTERCOM2 gain. The gain decreases about -10 dB with "-100", and increases about +10 dB with "+100".
UNBAL	OFF	OFF / ON	Selects the balance/unbalance mode. Can select ON/OFF for dynamic microphone setting, and fixed to ON for the carbon microphone.

[INTERCOM MODE]

Menu Item	Initial setting	Setting value	Description, Remarks
INTERCOM MODE	NORMAL	NORMAL / CROSS / 1LINE ENG / USA / PRESET1 /PRESET2	Performs DATA LOAD of presets. Also displays the loaded setting value. If the setting value is changed after being loaded, it becomes "USER".

[INTERCOM FUNCTION]

Menu Item	Initial setting	Setting value	Description, Remarks
INTERCOM FUNCTION			
AFTER VR MIX	OFF	ON / OFF	Switches between ON/OFF of AFTER VE MIX. When the ENG and PROD lines are mixed and listened, the volume adjustments can be assigned to INTERCOM 1 and 2 in ENG and PROD. Each of them can be adjusted individually.
INTERCOM1 VOL CTRL	BOTH	ENG/PROD/BOTH	When the AFTER VR MIX is turned on, the ENG/PROD lines are available, and are in an exclusive relationship with INTERCOM2 VOL CTRL. (Fixed to "BOTH" when AFTER VR MIX is turned off.)
INTERCOM2 VOL CTRL	BOTH	ENG/PROD/BOTH	When the AFTER VR MIX is turned on, the ENG/PROD lines are available, and are in an exclusive relationship with INTERCOM1 VOL CTRL. (Fixed to "BOTH" when AFTER VR MIX is turned off.)
FRONT MIC ON SEL	SW SEL	SW SEL / INC1 / INC2	The control of INTERCOM MIC button on the right side of the camera is linked to the MIC operation of INTEROCM. SW SEL : Use the INTERCOM MIC button to operate the microphone of the lines selected by INTERCOM selector switch. INC1 : The INTERCOM MIC button operates INTERCOM1. INC2 : The INTERCOM MIC button operates INTERCOM2. (Operable from the MIC switch on the rear panel in all modes.)
PGM FRONT VR	PGM1	PGM1 / PGM2	The PGM of the lines selected by INTERCOM selector switch are controlled with the INTERCOM PGM control knob on the right side of the camera.

<< INTERCOM/AUDIO continues to the next page >>

[INTERCOM SET UP (2/3)]

[INTERCOM1 SETUP INTERCOM1 SETUP]

<< INTERCOM/AUDIO continued >>

Menu Item	Initial setting	Setting value	Description, Remarks
INTERCOM1 SETUP			
TALK MIX	SW LINK	SW LINK / ENG / PROD / BOTH	Sets the selection of TALK line of INTERCOM1 by the switch on the back side of the camera and whether to fix it to ENG line, PROD line, or both lines.
RECEIVE MIX	SW LINK	SW LINK / ENG / PROD / BOTH	Sets the selection of RECEIVE line of INTERCOM1 by the switch on the back side of the camera and whether to fix it to ENG line, PROD line, or both lines.
ENG PHONE	LEFT	BOTH / LEFT / RIGHT	Sets the assignment of ENG channel to HEADSET.
PROD PHONE	LEFT	BOTH / LEFT / RIGHT	Sets the assignment of PROD channel to HEADSET.
INTERCOM2 --> INTERCOM1	OFF	OFF / BOTH / LEFT / RIGHT	Sets the assignment of INTERCOM2 channel to HEADSET.
PGM1	LEFT	OFF / BOTH / LEFT / RIGHT	Sets the assignment of PGM1 channel to HEADSET.
PGM2	LEFT	OFF / BOTH / LEFT / RIGHT	Sets the assignment of PGM2 channel to HEADSET.
PGM3	OFF	OFF / BOTH / LEFT / RIGHT	Sets the assignment of PGM3 channel to HEADSET.
TRACKER	OFF	OFF / BOTH / LEFT / RIGHT	Sets the assignment of TRACKER channel to HEADSET.
AUDIO MIC1	OFF	OFF / BOTH / LEFT / RIGHT	Sets the assignment of MIC1 channel to HEADSET.
AUDIO MIC2	OFF	OFF / BOTH / LEFT / RIGHT	Sets the assignment of MIC2 channel to HEADSET.
SIDE TONE	10	0 to 100	Adjusts the volume of SIDE TONE.
INTERCOM2 SETUP			
TALK MIX	SW LINK	SW LINK / ENG / PROD / BOTH	Sets the selection of TALK line of INTERCOM2 by the switch on the back side of the camera and whether to fix it to ENG line, PROD line, or both lines.
RECEIVE MIX	SW LINK	SW LINK / ENG / PROD / BOTH	Sets the selection of RECEIVE line of INTERCOM2 by the switch on the back side of the camera and whether to fix it to ENG line, PROD line, or both lines.
ENG PHONE	LEFT	BOTH / LEFT / RIGHT	Sets the assignment of ENG channel to HEADSET.
PROD PHONE	LEFT	BOTH / LEFT / RIGHT	Sets the assignment of PROD channel to HEADSET.
INTERCOM1 --> INTERCOM2	OFF	OFF / BOTH / LEFT / RIGHT	Sets the assignment of INTERCOM1 channel to HEADSET.
PGM1	LEFT	OFF / BOTH / LEFT / RIGHT	Sets the assignment of PGM1 channel to HEADSET.
PGM2	LEFT	OFF / BOTH / LEFT / RIGHT	Sets the assignment of PGM2 channel to HEADSET.
PGM3	OFF	OFF / BOTH / LEFT / RIGHT	Sets the assignment of PGM3 channel to HEADSET.
TRACKER	OFF	OFF / BOTH / LEFT / RIGHT	Sets the assignment of TRACKER channel to HEADSET.
AUDIO MIC1	OFF	OFF / BOTH / LEFT / RIGHT	Sets the assignment of MIC1 channel to HEADSET.
AUDIO MIC2	OFF	OFF / BOTH / LEFT / RIGHT	Sets the assignment of MIC2 channel to HEADSET.
SIDE TONE	10	0 to 100	Adjusts the volume of SIDE TONE.

<< INTERCOM/AUDIO continues to the next page >>

[INTERCOM SET UP (3/3)]

<< INTERCOM/AUDIO continued >>

Menu Item	Initial setting	Setting value	Description, Remarks
INTERCOM SET UP			
└ EARPHONE SETUP			
├ ENG	LEFT	OFF/BOTH/LEFT/RIGHT	Sets the assignment of ENG channel to EARPHONE.
├ PROD	LEFT	OFF/BOTH/LEFT/RIGHT	Sets the assignment of PROD channel to EARPHONE.
├ INTERCOM1	LEFT	OFF/BOTH/LEFT/RIGHT	Sets the assignment of INTERCOM 1 channel to EARPHONE.
├ INTERCOM 2	LEFT	OFF/BOTH/LEFT/RIGHT	Sets the assignment of INTERCOM2 channel to EARPHONE.
├ PGM1	RIGHT	OFF/BOTH/LEFT/RIGHT	Sets the assignment of PGM1 channel to EARPHONE.
├ PGM2	RIGHT	OFF/BOTH/LEFT/RIGHT	Sets the assignment of PGM2 channel to EARPHONE.
├ PGM3	RIGHT	OFF/BOTH/LEFT/RIGHT	Sets the assignment of PGM3 channel to EARPHONE.
├ AUDIO MIC1	OFF	OFF/BOTH/LEFT/RIGHT	Sets the assignment of MIC1 channel to EARPHONE.
├ AUDIO MIC2	OFF	OFF/BOTH/LEFT/RIGHT	Sets the assignment of MIC2 channel to EARPHONE.
└ TRACKER	LEFT	OFF/BOTH/LEFT/RIGHT	Sets the assignment of TRACKER channel to EARPHONE.

[EARPHONE VOL SETUP]

Menu Item	Initial setting	Setting value	Description, Remarks
EARPHONE VOL SETUP	30	0 to 80	Adjusts the volume of EARPHONE.

<< INTERCOM/AUDIO continues to the next page >>

[INTERCOM SET UP(E) (1/2)]

<< INTERCOM/AUDIO continued >>

Menu Item	Initial setting	Setting value	Description, Remarks
INTERCOM SET UP(E)			
INTERCOM 1/2 MIC VOL	100	0 to 200	Finely adjusts the volume of MIC1 and MIC2 for INTERCON1/2.
INTERCOM VOL CURVE SETUP			Finely adjusts the volume curve of your preference for the knob.
INTERCOM1			
INTERCOM	NORMAL	LOW/ NORMAL/HIGH	Switches the volume change level for the knob. LOW : Setting for fine adjustment of low volume for in-ear-canal headphones, etc. NORAML : Setting for normal operating environment. HIGH : Setting for rough adjustment of the volume regardless of audio quality.
PGM1/2	NORMAL	LOW / NORMAL / HIGH	Switches the volume change level for the knob. LOW : Setting for fine adjustment of low volume for in-ear-canal headphones, etc. NORAML : Setting for normal operating environment. HIGH : Setting for rough adjustment of the volume regardless of audio quality.
PGM3 (VOLUME SET)	100	0 to 200	Adjusts the volume of PGM3.
INTERCOM2			
INTERCOM	NORMAL	LOW/NORMAL/HIGH	Switches the volume change level for the knob. LOW : Setting for fine adjustment of low volume for in-ear-canal headphones, etc. NORAML : Setting for normal operating environment. HIGH : Setting for rough adjustment of the volume regardless of audio quality.
PGM1/2	NORMAL	LOW / NORMAL / HIGH	Switches the volume change level for the knob. LOW : Setting for fine adjustment of low volume for in-ear-canal headphones, etc. NORAML : Setting for normal operating environment. HIGH : Setting for rough adjustment of the volume regardless of audio quality.
PGM3 (VOL SET)	100	0 to 200	Adjusts the volume of PGM3.
INTERCOM2 B.P(OPTION)			
INTERCOM2 B.P MODE	INTERCOM	INTERCOM / BELTPACK	Sets when the belt pack is connected to INTERCOM2.
LEVEL	CC	CC / RTS	Selects a type of belt pack.
FINE	0	-100 to 100	Finely adjusts the amplifier gain of the INTERCOM2 microphone. The amplifier gain is decreased by about -10dB at "-100", and increased by about +10dB at "+100".
INTERCOM MODE SETUP			
DATA LOAD	READY	READY/NORMAL /CROSS/1LINE ENG/ USA/PRESET1/ PRESET2/CANCEL	Loads the connection setting (preset setting) of INTERCOM line.
DATA SAVE	READY	READY/PRESET1 /PRESET2/CANCEL	Saves the connection setting (preset setting) of INTERCOM line.
PGM SETUP(OPTION)			
PGM1	OFF	ON / OFF	Sets the ON/OFF for outputting PGM1 signal to PGM line.
PGM2	OFF	ON / OFF	Sets the ON/OFF for outputting PGM2 signal to PGM line.
PGM3	ON	ON / OFF	Sets the ON/OFF for outputting PGM3 signal to PGM line.
AUDIO MIC1	OFF	ON / OFF	Sets the ON/OFF for outputting AUDIO MIC1 channel to PGM line.
INTERCOM2	OFF	ON / OFF	Sets the ON/OFF for outputting AUDIO MIC2 channel to PGM line.
PGM VOL SETUP(OPTION)	0dB	+4dB / 0dB /-20dB	Sets the output level of PGM.

<< INTERCOM/AUDIO continues to the next page >>

[INTERCOM SET UP(E) (2/2)]

[TRACKER SETUP]

<< INTERCOM/AUDIO continued >>

Menu Item	Initial setting	Setting value	Description, Remarks
RECEIVE 1/2 CH SETUP			
— ENG	OFF	OFF/BOTH / TRACKER1 / TRACKER2	Sets the assignment of ENG channel to TRACKER INTERCOM 1/2.
— PROD	OFF	OFF/BOTH / TRACKER1 / TRACKER2	Sets the assignment of PROD channel to TRACKER INTERCOM 1/2.
— INTERCOM1	OFF	OFF/BOTH / TRACKER1 / TRACKER2	Sets the assignment of INTERCOM1 channel to TRACKER INTERCOM 1/2.
— INTERCOM2	OFF	OFF/BOTH / TRACKER1 / TRACKER2	Sets the assignment of INTERCOM2 channel to TRACKER INTERCOM 1/2.
— PGM1	OFF	OFF/BOTH / TRACKER1 / TRACKER2	Sets the assignment of PGM1 channel to TRACKER INTERCOM 1/2.
— PGM2	OFF	OFF/BOTH / TRACKER1 / TRACKER2	Sets the assignment of PGM2 channel to TRACKER INTERCOM 1/2.
— PGM3	OFF	OFF/BOTH / TRACKER1 / TRACKER2	Sets the assignment of PGM3 channel to TRACKER INTERCOM 1/2.
— AUDIO MIC1	OFF	OFF/BOTH / TRACKER1 / TRACKER2	Sets the assignment of AUDIO MIC1 channel to TRACKER INTERCOM 1/2.
— AUDIO MIC2	OFF	OFF/BOTH / TRACKER1 / TRACKER2	Sets the assignment of AUDIO MIC2 channel to TRACKER INTERCOM 1/2.
RECEIVE 3/4 CH SETUP			
— ENG	OFF	OFF/BOTH / TRACKER3 / TRACKER4	Sets the assignment of ENG channel to TRACKER INTERCOM 3/4.
— PROD	OFF	OFF/BOTH / TRACKER3 / TRACKER4	Sets the assignment of PROD channel to TRACKER INTERCOM 3/4.
— INTERCOM1	OFF	OFF/BOTH / TRACKER3 / TRACKER4	Sets the assignment of INTERCOM1 channel to TRACKER INTERCOM 3/4.
— INTERCOM2	OFF	OFF/BOTH / TRACKER3 / TRACKER42	Sets the assignment of INTERCOM2 channel to TRACKER INTERCOM 3/4.
— PGM1	OFF	OFF/BOTH / TRACKER3 / TRACKER42	Sets the assignment of PGM1 channel to TRACKER INTERCOM 3/4.
— PGM2	OFF	OFF/BOTH / TRACKER3 / TRACKER4	Sets the assignment of PGM2 channel to TRACKER INTERCOM 3/4.
— PGM3	OFF	OFF/BOTH / TRACKER3 / TRACKER4	Sets the assignment of PGM3 channel to TRACKER INTERCOM 3/4.
— AUDIO MIC1	OFF	OFF/BOTH / TRACKER3 / TRACKER4	Sets the assignment of AUDIO MIC1 channel to TRACKER INTERCOM 3/4.
— AUDIO MIC2	OFF	OFF/BOTH / TRACKER3 / TRACKER4	Sets the assignment of AUDIO MIC2 channel to TRACKER INTERCOM 3/4.
RECEIVE VOL LEVEL	-20dB	-20dB / 0dB	Changes the output gain of TRACKER.
TALK SETUP			
— MIC	OFF	ON / OFF	Controls the ON/OFF of TRACKER MIC.
— UNBAL	OFF	ON / OFF	Sets the unbalance receive mode of TRACKER MIC.
— GAIN	-20dB	-20dB / 0dB	Sets the mic gain of TRACKER MIC.
— FINE	0	-100 to 100	Finely adjusts the gain of the TRACKER MIC microphone. The gain is decreased by about -10dB at "-100", and increased by about +10dB at "+100".
TRACKER MIX	OFF	ENG/PRD/ BOTH/OFF	Selects whether to connect the TALK line of TRACKER to ENG line, PROD line, or both, or not to connect to the SYSTEM lines.

<< INTERCOM/AUDIO continues to the next page >>

[MEMORY COARD]

<< INTERCOM/AUDIO continued >>

Menu Item	Initial setting	Setting value	Description, Remarks
MEMORY CARD			
SAVE FILE			
INTERCOM FILE	-		Save the setting values related to INTERCOM.
TRACKER FILE	-		Save the setting values related to TRACKER.
LOAD FILE			
INTERCOM FILE	-		Calls the setting values related to INTERCOM.
TRACKER FILE	-		Calls the setting values related to TRACKER.

■ *VIDEO I/O*

Sets the assignment of video signals for input/output connector of the camera.

Menu Item	Initial setting	Setting value	Description, Remarks
SDI OUT1 SEL	VF	RET-1, RET-2, RET-3, RET-4, HD Q-TV1, HD Q-TV2, VF, MON, RET-1 SEL, RET-2 SEL	Sets the signals outputted from the SDI OUT1 connector. When they are set to RET-1 SEL and RET-2 SEL, they are linked to RET-1/RET-2 selector switch on the back.
SDI OUT2 SEL	VF	RET-1, RET-2, RET-3, RET-4, HD Q-TV1, HD Q-TV2, VF, MON, RET-1 SEL, RET-2 SEL	Sets the signals outputted from the SDI OUT2 connector. When they are set to RET-1 SEL and RET-2 SEL, they are linked to RET-1/RET-2 selector switch on the back.
SDI OUT3 SEL	VF	RET-1, RET-2, RET-3, RET-4, HD Q-TV1, HD Q-TV2, VF, MON, RET-1 SEL, RET-2 SEL	Sets the signals outputted from the SDI OUT3 connector. When they are set to RET-1 SEL and RET-2 SEL, they are linked to RET-1/RET-2 selector switch on the back.
SDI I/O4 SEL	VF	RET-1, RET-2, RET-3, RET-4, HD Q-TV1, HD Q-TV2, VF, MON, RET-1 SEL, RET-2 SEL, HD TRUNK	Sets the signals outputted from the SDI OUT4 connector. When they are set to RET-1 SEL and RET-2 SEL, they are linked to RET-1/RET-2 selector switch on the back. Only SDI I/O4 can be set to the HD TRUNK input.
BARS MODE(E)	Setting value	FULL, MULTI	FULL : Displays the BARS signals used historically. MULTI: Displays the multi-format BARS signals.
BARS(E)	OFF	ON, OFF	Switches between ON/OFF of the color BARS signals.

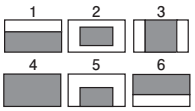
Caution:

CHAR : Character generator test signals.
MON : Monitor video signal output for CCU.

■ *LENS*

Performs the settings required to set lens irises and create lens files.

[AUTO IRIS SET] Sets the operating conditions of the auto iris.

Menu Item	Initial setting	Setting value	Description, Remarks
AUTO IRIS SET			
IRIS SET MODE	OFF	ON, OFF	ON : Enables auto-iris operation setting. If set to "ON", the iris adjustment from the remote controller is disabled.
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.
WINDOW	1	WINDOW1 to 6 	Sets the level detection range of the auto iris.
IRIS SPEED	50	1 to100	Sets the response speed characteristics of the auto-iris. The auto-iris speed becomes slower for "1" and faster for "100".
IRIS GAIN	50	1 to100	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 LIMIT	F22	F22, F20, F18, F16	The F value when the iris is set to maximum aperture during the auto iris operation.

<< LENS continues to the next page >>

[LENS: FILE SETTING]

<< LENS continued >>

Menu Item	Initial setting	Setting value	Description, Remarks
FILE SETTING			
NUMBER	OFF	NO.1 to NO.16, OFF	Selects the lens file No. - If the lens code is obtained from the lens, "(CODE SEL)" is displayed on the back of the lens No. display. - If "AUTO SEL" is set to "ON", "(AUTO SEL)" is displayed on the back of the lens No. display.
NAME	(---------)	12 characters	Sets the file name per lens file. Giving the lens type name, etc. makes easier to find the lens No. and lens compatibility.
(MODEL)	(---------)	Name display section for AUTO SEL	Displays the lens name obtained from the serial lens.
EXTENDER	OFF	ON-1, ON-2, ON-3, x0.8 CONV, OFF	Displays the extender status.
AUTO SEL	OFF	ON, OFF	Automatically switches the lens file No. according to the type name obtained from the lens.
FILE SET	OFF	MANUAL, AUTO, OFF	Please refer to "5.4 Creates the Lens File" for more details on FILE SET.
LENS TYPE	OFF	C.PORTABLE C.STUDIO C.FIELD F.PORTABLE F.STUDIO F.FIELDOFF OFF	Sets the lens type used to match the operation property of the zoom tracking DTL to the zoom property of the lens. *1, *2
SERIAL I/F (E)	ENABLE	ENABLE, DISABLE	Sets the ENABLE/DISABLE to the serial interface of the lens.

Caution:

*1: Lens type
- C.PORTABLE : Canon portble lens
- C.STUDIO : Canon studio lens
- C.FIELD : Canon field lens
- F.PORTABLE : Fujinon portble lens
- F.STUDIO : Fujinon studio lens
- F.FIELD : Fujinon field lens
- OFF : Zoom tracking DTL is OFF.

*2: This is set per lens file (No. 1 - 8).

■ *FUNCTION SW*

Sets the function switches of the camera and viewfinder.

Menu Item	Initial setting	Setting value	Description, Remarks
FUNC SW1	RET-1	RET-1, RET-2, ABB, AWB, FOCUS ASSIST, DISPLAY MODE, P-IN-P(RET)	Selects the function to be assigned to each function switch. If it is set to ABB and AWB, ABB and AWB are performed when the function switch is pressed and held. If it is set to FOCUS ASSIST, the following operation is performed. The [ASSIST AREA] items on the TOP MENU - FOCUS ASSIST - FOCUS ASSIST WINDOW screen are switched every time SW is pressed. When the serial lens is attached: Repeats TRIGGER ON <__> OFF. When items other than serial lens are attached: Repeats ALWAYS ON <__> OFF
FUNC SW2	RET-2	RET-1, RET-2, ABB, AWB, FOCUS ASSIST	
HANDLE RET SW	RET	RET, ZOOM-, FOCUS, NONE	Sets the button function of RET-1 and RET-2/MIC on the top part of the handle. To assign it to ZOOM and FOCUS, it requires a serial lens.
ZOOM SPEED	15	0 to 100	Sets the operation speed of ZOOM control. "0" indicates a slow speed and "100" indicates a high speed.
FOCUS SPEED	15	0 to 100	Sets the operation speed of FOCUS control. "0" indicates a slow speed and "100" indicates a high speed.
VTR SW	RET-2	RET-2, MIC, FOCUS ASST	Sets a function of the VTR SW button on the lens. If the TRIGGER item on the FOCUS ASSIST menu is set to "LENS VTR", "FOCUS TRIG" is fixed (information display).
RET-2/MIC SW	RET-2	RET-2, MIC	Sets the function to the RET-2/MIC button on the top part of the handle and the left side of the camera.
VF F1 SW [VF]	MONO	NONE, CAPTURE, CHROMA, CPTDISP, FAN, GAMMA, MAG, MARKER, MONO, NOISESUP, PEAKING, PEAKUP, PRESET, REVERSE, SCENE, SDI, TALLY, USRMRK, VSC, WFM, ZMPEAK, P-IN-P(VF), GAMMA1.4, FOCUS ASSIST, P-IN-P(RET)	Sets the function to the FUNCTION switch F1.
VF F2 SW [VF]	MARKER		Sets the function to the FUNCTION switch F2.
VF F3 SW [VF]	SDI		Sets the function to the FUNCTION switch F3.
VF F4 SW [VF]	TALLY		Sets the function to the FUNCTION switch F4.

■ *VIDEO ADJUSTMENT*

Sets the functions that perform video signal processing automatically or manually.

[AUTO SETUP MODE]

Menu Item	Initial setting	Setting value	Description, Remarks
AUTO SETUP MODE			
AUTO SETUP	LEVEL	LEVEL,FULL,QUICK, F.QUICK,AWS, ABS	Performs each AUTO SETUP.
FULL AUTO REF	INT	INT, EXT	INT : Sets to the default factory setting. EXT : Sets to the user setting.
AWB WITH A.IRIS	ON	ON, OFF	Selects whether to automatically include the A.IRIS when the AWB is performed. This menu is enabled only during the self contain operation. It is always “OFF” during the CCU 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	ENABLE	ENABLE, DISABLE	ENABLE : Automatically adjusts the angle of view of the chart when FULL AUTO SETUP is performed. DISABLE : Manually adjusts the angle of view of the chart when FULL AUTO SETUP is performed.
REFERENCE SET	ABB	ABB, AWB	Creates the convergence value (EXT REF FILE) of AWB and ABB.

[PROCESS SETUP]

Menu Item	Initial setting	Setting value	Description, Remarks
PROCESS SETUP			
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”.
MANUAL CLR	READY	READY, PUSH SET→CLR, CANCEL	Returns the settings changed with LEVEL ADJUST to the state prior to change as a group.
SMOOTH STEP GAIN	ON-0.5s	ON-0.3s, ON-0.5s, ON-0.7s,ON-1.0s, ON-1.5s, ON-2.0s, OFF	Changes the STEP GAIN step by step. Possible to choose the time until convergence.
GAMMA TYPE	NORMAL	NORMAL, CUSTOM1-5	Selects the type of gamma curve. NORMAL : Normal gamma curve CUSTOM1-5 : Custom gamma curve *3
MATRIX	1	1, 2, 3, OFF	There are independent settings for three channels of the matrix, which can be switched.
ADVANCED MATRIX	OFF	ON, OFF	Turns on/off the advanced matrix.
HV SLIM DTL TYPE	H ONLY	H ONLY, V ONLY, H+V	Sets the type of SLIM DTL.
V SLIM DTL FREQ	A	A, B, C, D	Sets the boost frequency type of SLIM DTL.
NR MODE	OFF	OFF, LOW, HIGH	Sets the NR (noise reducer).
DOWN CONV FILTER	STD	STD, HI, HQ, LOW	Sets the FIR-FILTER for converting 4K video to HD (1080i / 1080p).

<< VIDEO ADJUSTMENT continues to the next page >>

Caution:

*3: Refer to next page of the "CUSTOM GAMMA" for custom gamma data editing.

[CUSTOM GAMMA]

<< VIDEO ADJUSTMENT continued >>

Menu Item	Initial setting	Setting value	Description, Remarks
CUSTOM GAMMA			
EASY MODE			Easy creation mode. Sets various parameters and creates the custom gamma data.
DEFAULT RESET	-	EXECUTE,CANCEL	Returns to the original custom gamma data. The original data cannot be recovered once it is overwritten with the “SAVE” function.
SELECT	NORMAL	NORMAL,CUSTOM1 to 5	Selects the gamma table to be created.
CURVE TYPE	NORMAL	NORMAL, LOG, SPECIAL	Sets the basic properties of gamma curve.
INITIAL GAIN	4.5	1.0 to 9.0	Sets the slope of gamma curve at around 0%. The curve rises steeply as the value increases.
18% GRAY	58.0%	14.0% to 107.0%	Sets what level it should be after the gamma has been applied when converting from 18% level before applied.
DYNAMIC RANGE	600%	100% to 600%	Sets the maximum level (the maximum input level to the gamma) before the gamma has been applied.
WHITE LIMIT	109%	70% to 109%	Sets the white clip after the gamma has been applied.
CAL	OFF	OFF, CAL100%, CAL200%	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.
FLEXIBLE MODE			
DEFAULT RESET	READY	EXECUTE, CANCEL	Resets the custom gamma data created.
SELECT	NORMAL	NORMAL, CUSTOM1 to 5	Selects the gamma table to be created.
POINT	100%	35 to 440%	Sets the video level before gamma.
WIDTH	60%	20 to 100%	Sets the width of the video level. The zebra pattern signals indicate the range of the video level for adjustment.
LEVEL	0	-100 to +100	Adjusts the level within the setting range of "POINT" and "WIDTH". A gamma curve with a smooth curve can be created focusing around the point.
CAL	OFF	OFF, CAL100%, CAL200%	Selects the test waveform (CAL) to check the gamma table.
SHUTTER	OFF	OFF, PRESET, VARIABLE	Selects the electronic shutter.
SHUTTER SPEED	---	PRESET 1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000 VARIABLE	Switches the shutter speed. (Only when SHUTTER is PRESET and VARIABLE)
SUPER V	OFF	OFF, ON	Sets the ON/OFF of the SUPER V.
GAMMA CURVE COPY	---	CUSTOM1 to 5, ALL > CUSTOM1 to 5, ALL	Copies the custom gamma data created to other gamma table in the camera.
USB MEMORY			
SAVE	---		Saves the custom gamma data to the USB memory.
LOAD	---		Loads the custom gamma data from the USB memory.
DIGITAL EXTENDER MODE			
DIGITAL EXTENDER	OFF	OFF, ON	Sets the ON/OFF of the digital extender.
MAGNIFICATION	x1.5	x1.5, x2, x3, x4	Sets the magnification of the digital extender.

<< VIDEO ADJUSTMENT continues to the next page >>

[MATRIX]

<< VIDEO ADJUSTMENT continued >>

Menu Item	Initial setting	Setting value	Description, Remarks
MATRIX PRESET DATA (E)			
MATRIX 1	BT.709	OFF, BT.709, SMPTE, EBU, BT.2020, USER1, USER2	Selects the preset of color matrix. * In order to select USER1 and 2, you must turn on "MATRIX USER1(2) DATA SET - DATA SET MODE."
MATRIX 2	BT.2020		
MATRIX 3	SMPTE		
MATRIX USER1 DATA SET (E)			Sets the preset (USER1) of color matrix.
DATA SET MODE	OFF	ON, OFF	ON : : Sets the preset data. OFF : Does not set the preset data.
R-G	0.0	-100 to+100	Sets the matrix of R-G.
R-B	0.0	-100 to+100	Sets the matrix of R-B.
G-R	0.0	-100 to+100	Sets the matrix of G-R.
G-B	0.0	-100 to+100	Sets the matrix of G-B.
B-R	0.0	-100 to+100	BSets the matrix of B-R.
B-G	0.0	-100 to+100	Sets the matrix of B-G.
DATA CLEAR	---	READY	READY : Normal status PUSH SET --> CLR : Clears the preset data. CANCEL : Exit "DATA CLEAR" without clearing the settings.
MATRIX USER2 DATA SET (E)			Sets the preset (USER2) of color matrix.
DATA SET MODE	OFF	ON, OFF	ON : Sets the preset data. OFF : Does not set the preset data.
R-G	0.0	-100 to+100	Sets the matrix of R-G.
R-B	0.0	-100 to+100	Sets the matrix of R-B.
G-R	0.0	-100 to+100	Sets the matrix of G-R.
G-B	0.0	-100 to+100	Sets the matrix of G-B.
B-R	0.0	-100 to+100	BSets the matrix of B-R.
B-G	0.0	-100 to+100	Sets the matrix of B-G.
DATA CLEAR	---	READY	READY : Normal status PUSH SET --> CLR : Clears the preset data. CANCEL : Exit "DATA CLEAR" without clearing the settings.

[OPTICAL ABERRATION CORR]

<< VIDEO ADJUSTMENT continued >>

Menu Item	Initial setting	Setting value	Description, Remarks
OPTICAL ABERRATION CORR. (E)			
CORRECTION	ENABLE	ENABLE, DISABLE	Switches between Enable/Disable of aberration correction. This setting is saved when the power is turned off. Therefore, set it to "DISABLE" if aberration correction is not used.
CORR. LEVEL	0	-10 to 10	Changes the intensity of the correction.
OAC GUIDE MARK	ON	ON, OFF	Sets whether a reminder to be shown on the VF or not when the aberration correction value is not properly received from the serial lens.
AUTO DPC(E)			Performs automatic scratch correction of imaging element.

■ *TALLY/INDICATOR*

Sets the conditions for information displayed on the TALLY display and viewfinder.

Menu Item	Initial setting	Setting value	Description, Remarks
FRONT TALLY [VF]	LOW	OFF, LOW, HIGH	Sets the ON/OFF of brightness and display of the front Tally.
VF TALLY LEVEL [VF]	7	1 to 10	Sets the brightness of VF Tally.
TALLY MODE [VF]	G-R-G	G-R-G, R-G-R, R-R-R	Sets the display position of VF R/G Tally.
BEZEL INDICATOR [VF]	ENABLE	ENABLE, DISABLE	Sets to disable the indicator light in the frame.
VOLUME INDICATOR [VF]	OFF	ON, OFF	Sets the ON/OFF of the setting value displays for the VF PEAKING/ CONTRAST/BRIGHT.
ZOOM INDICATOR [VF]	OFF	ON, OFF	Sets the ON/OFF of the ZOOM position indicator display.
FOCUS INDICATOR [VF]	OFF	ON, OFF	Sets the ON/OFF of theFOCUS position indicator display.
ZEBRA SETTING			(Hidden when using SE)
ZEBRA	OFF	ON, OFF	Superimposes the zebra pattern signals to video when the video level exceeds each DETECT LEVEL. -The first zebra signals: Fine zebra pattern running towards the top right of the screen (Tone management of the entire screen) -The second zebra signals: Thick zebra pattern running towards the bottom right of the screen (Tone management of subjects such as faces)
ZEBRA1 DETECT	100%	30 to 109%	Sets the judgment level of the first zebra signals.
ZEBRA2 IND	OFF	ON, OFF	Selects the ON/OFF of the second zebra signals.
ZEBRA2 DETECT	70%	30 to 109%	Sets the judgment level of the second zebra signals.
ZEBRA IND LVL	78	1 to 100	Sets the superimposition level of the second zebra signals.
WFM/VSC SETTING [VF]			Sets the waveform monitor (WFM).
WAVE FORM [VF]	OFF	ON, OFF	Sets the ON/OFF of WFM display.
DIMMER[VF]	MID	LOW, MID,HIGH	Sets the brightness of WFM.
SIZE[VF]	NORMAL	NORMAL, SMALL	Sets the display of WFM.
POSITION[VF]	RIGHT	RIGHT, LEFT , CENTER	Sets the display position (right/left/center) of WFM.
COLOR[VF]	WHITE	WHITE, GREEN	Sets the display color (white/green) of WFM.
VECTOR SCOPE[VF]	OFF	ON, OFF	Sets the ON/OFF of the vector scope (VSC) display.
DIMMER[VF]	MID	LOW, MID,HIGH	Sets the brightness of VSC.
MAGNIFICATION[VF]	X1	X1, X2, X4, X8	Sets the magnification (×1/2/4/8) of VSC.
SCALE[VF]	100%	80%,100%	Sets the scale display (75%/100%) of COLOR BOX.
POSITION[VF]	RIGHT	RIGHT, LEFT , CENTER	Sets the display position (right/left/center) of vector scope.
COLOR[VF]	WHITE	WHITE, GREEN	Sets the display color (white/green) of VSC.

■ *FAN CONTROL*

Sets the operating conditions of air cooling fans built in the camera and viewfinder.

Menu Item	Initial setting	Setting value	Description, Remarks
CAMERA FAN CONT MODE	AUTO	AUTO, STOP	AUTO : Automatically changes the cooling fan speed according to the internal temperature level. 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. *4
VF FAN CONT MODE[VF]	AUTO	AUTO, OFF (Forced), ON (Forced)	Sets the FAN operation of VF to AUTO/Force OFF/Force ON.
CAMERA	---	(information display)	SSLOW : The fan speed is very slow. SLOW : The fan speed is slow. NOR : Normal fan speed. FAST : The fan speed is fast. NG : Fan malfunction
VF			

Caution:

*4: The surface temperature of the enclosure may be increased higher than the normal temperature when the STOP mode is selected.

■ *FILE OPERATION*

Saves and sets various data using USB memory.

Menu Item	Initial setting	Setting value	Description, Remarks
USB MEMORY			Please refer to "128* page" for the usage of USB memory.
SAVE FILE			
ALL DATA	---		Saves the selected data to the USB memory.
SNAP SHOT	---		
SCENE	---		
REFERENCE	---		
LENS	---		
MENU DATA	---		
LOG DATA	---		
LOAD FILE			
ALL DATA	---		Loads ALL files.
SNAP SHOT	---		Reads snap shot files.
SCENE	---	ALL, SELECT NUMBER	Selects all (bulk) or single item (selected from 1 to 8) from SCENE DATA.
PREFERENCE	---		Loads the reference file.
LENS	---	ALL, SELECT NUMBER	Selects all (bulk) or single item (selected from 1 to 8) from LENS DATA.
MENU DATA	---	ALL, VF	Selects whether to load the entire MENU or only menu related "VF" or only menu related "AUDIO" from "MENU DATA".
LOG DATA	---		
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	ENGIN-EER	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	Selects from settings ready, start, or cancel.
PRESET FILE SAVE (E)			Saves the level adjustment and the setting status of the menu. The saved data can be loaded as user settings data of "PRESET FILE LOAD" .
FILE SELECT	ENGIN-EER	fixed to ENGINEER	Saves the user settings.
SAVE START	READY	READY, START, CANCEL	Execute the save.
PROGRAM UPDATE (E)			
FILE SELECT	---		Updates all programs. (SOFT & DPROC FPGA & DRIVE POLSE FPGA) *5

Caution:

*5: The package version is updated by this update.

■ *SYSTEM*

Performs various settings for the basic operation of the camera.

Menu Item	Initial setting	Setting value	Description, Remarks
SYSTEM			
SCAN MODE	Delivery destination Set	2160P59, 2160P50	Selects the camera operational configuration. (It can be set only for self-operation.)
H PHASE	0.0	-100 to +100	Matches the phase of internal synchronization signals with the phase of external synchronization signals. The internal synchronization goes forward in "-" direction and delays with "+" direction compared to external synchronization. (It can be set only for self contain operation.)
FILTER SERVO CONT	SERVO	SERVO ,MANUAL	SERVO : Sets to the automatic control. MANUAL : Sets to the manual control.
BATT WARN VOLT	11.0V	10.5 to 13.5V	Sets the battery voltage value that issues the warning.
CAMERA ID SETUP (E)			
PROGRAM NO. (E)	1	1 to 99, OFF	Sets the camera No. at the time of program operation, etc. If the display of the camera No. is set on the OCP side, the set ID No. is displayed. If the camera No. is set on the camera side, the set ID No. is displayed on OCP.
ID NO. (E)	1	1 to 40	Sets ID No. of the camera. Sets this when you want the camera No. to be detected and displayed on the CCU side.
FIBER SINGLE MODE CONT (E)	OFF	ON, OFF	Supplies power to the camera from an external power supply DC connector with CCU connected. So, stop the power supply from the optical cable. If it is sets to "ON," the mode is switched to the single fiber mode.
SIMUL MODE (E)	NORMAL	NORMAL, INDEP GAMMA, OFF	Selects SIMUL MODE. NORMAL In this mode, parameters related to color adjustment function (Color) and outline correction function (Detail) can be individually set in 4K output and HD output. Other controls are multi-link settings. INDEP GAMMA In addition to NORMAL adjustment above, this mode can independently adjust controls including GAMMA, KNEE, GAIN, PED, and WHITE CLIP for 4K and HD outputs. OFF 4The 4K and HD outputs are controlled by common adjustment parameters.
DATE(YY/MM/DD) (E)	---	YY / MM / DD	Sets the date and time for saving files to a USB memory.
TIME (E)	---	HH : MM : SS	Sets the date and time for saving files to a USB memory.

■ *INFORMATION*

Provides the operating conditions and specific information of the camera for maintenance, inspection, and services.

Menu Item	Initial setting	Setting value	Description, Remarks
WORKING TIME	---	*****.*H (Information display)	Displays the total accumulated operation time of the camera up to the present.
SUB WORKING TIME	---	*****.*H (Information display) RESET	Displays the cumulative operating time of the camera up to the current time. Users can reset arbitrarily unlike "WORKING TIME".
FIRMWARE VERSION	---		
CAMERA			
MAIN UNIT			
SOFTWARE	---	STRB6001V**.**.** (Information display)	Displays the software version of the main unit.
CHECH SUM	---	(Information display)	Displays the software checksum of the main unit.
M_PROC(FPGA)	---	(Information display)	Displays the version of FPGA, CPLD.
M_ROC(CPLD)	---		
M_TRX	---		
M_AUDIO_SUB	---		
SENSOR UNIT	---		
SENSOR UNIT SERIAL NUMBER	---		
SOFTWARE	---	(Information display)	Displays the version information of sensor unit software.
CHECK SUM	---		Displays the error detection code of sensor unit software.
S_PROC	---		Displays the version of FPGA.
VF			
SOFTWARE	---	(Information display)	Displays the software version of VF.
FPGA	---	(Information display)	Displays the FPGA version.
HARDWARE VERSION			
CAMERA			
MAIN UNIT			
M.PROC	---	(Information display)	Displays the version information of the module PCB.
M.TRX	---	(Information display)	
SENSOR UMIT			
S.PROC	---	(Information display)	
VF			
H/W VERSION	---	(Information display)	Displays the version information of the module PCB.

<< INFORMATION continues to the next page >>

[MODULE SW (CAMERA)]

<< INFORMATION continued >>

Menu Item	Initial setting	Setting value	Description, Remarks
SERIAL NUMBER			
├ MAIN UNIT	---	(Information display)	Sets the serial number of the main unit.
└ SENSOR UNIT	---	(Information display)	Sets the serial number of the sensor unit.
MODULE SW		(Information display)	Displays the setting status of dip switches on the camera PCB.

■ *MENU MODE*

Sets the menu mode.

Menu Item	Initial setting	Setting value	Description, Remarks
ENGINEER MENU	OFF	ON, OFF	If set to ON, possible to display engineer menu. If the camera power is turned OFF, this menu setting returns to OFF.

■ *VF MENU*

This section Introduces an example of the setting menu of the viewfinder.
The viewfinder has functions to perform various settings independent from the signals for viewfinder created in the camera device. The example here shows the menu screen for the VFL701D. Please refer to the operation manual of respective viewfinder for more details.

Menu Item	Initial setting	Setting value	Description, Remarks
SETTING			
1 VOLUME PRESET			
├ CONTRAST	0	-64 to +63	Sets the contrast (preset) level.
└ BRIGHT	0	-64 to +63	Sets the brightness (preset) level.
2 H POSITION	0	-10 to +10	Sets the horizontal video position.
3 V POSITION	0	-10 to +10	Sets the vertical video position.
4 BATTERY TYPE	EXT.DC		Displays the input voltage when an external power (EXT DC) is used for VF.
5 RESERVE SCAN	OFF	ON, OFF	Sets the top/bottom and left/right inversion display of the VF screen.
6 SCREEN SAVER	TYPE-A	TYPE-A, TYPE-B, OFF	Sets the screen saver.
└ TIMER	10MIN	OFF, 5, 10, 15, 30, 60MIN.	Sets the amount of time before the screen saver starts.
USER MARKER			
1 USER MARKER	OFF	ON, OFF	Sets the display of user marker.
2 MARKER LEVER	60%	80%,60%,40%,20%	Sets the display level of user marker.
3 SCENE SELECT	SCENE1	SCENE1 to SCENE5	Selects from 6 types of scenes.
└ RESET SCENE DATA	-	-	Resets the setting scene display.
<SCENE1>	-	-	Displays the scene No. that is currently selected.
MRK1: OFF □ …	OFF	ON, OFF	Sets the display/color/execution of User Marker 1.
MRK2: OFF □ …	OFF	ON, OFF	Sets the display/color/execution of User Marker 2.
MRK3: OFF □ …	OFF	ON, OFF	Sets the display/color/execution of User Marker 3.
MRK4: OFF □ …	OFF	ON, OFF	Sets the display/color/execution of User Marker 4.
MRK5: OFF □ …	OFF	ON, OFF	Sets the display/color/execution of User Marker 5.
MRK6: OFF □ …	OFF	ON, OFF	Sets the display/color/execution of User Marker 6.

<< VF MENU continues to the next page >>

<<VIDEO ADJUSTMENT continued>>

	Menu Item	Initial setting	Setting value	Description, Remarks
USB MEMORY				
	< VF ---> USB MEMORY >			
1	SAVE VF STATUS	-	-	Writes various settings of VF to the USB memory.
2	SAVE USER MARKER(ALL)	-	-	Writes user markers to the USB memory.
3	SAVE CAPTURE IMAGE	-	-	Writes capture images to the USB memory.
	< USB MEMORY ---> VF >			
4	LOAD VF STATUS	-	-	Downloads various settings saved in the USB memory to VF.
5	LOAD USER MARKER(ALL)	-	-	Downloads user markers saved in the USB memory to VF.
6	LOAD CAPTURE IMAGE	-	-	Downloads capture images saved in the USB memory to VF.
UPDATE				
	└ INF/UPDATE	-	-	Displays and updates the VF information.
1	MPU VERSION	-	-	Displays the version information of MPU.
2	FPGA VERSION	-	-	Displays the version information of FPGA.
3	H/W VERSION			Displays the version information of the module PCB.
4	WORKING TIME			Displays the cumulative operating time of VF up to the current time.
5	UPFATE			Updates from the USB memory.
	├ MPU VERSION			Updates MPU from the USB memory.
	└ FPGA VERSION			Updates FPGA from the USB memory.
6	LOAD CAPTURE IMAGE	-	-	Resets the setting data to the factory default settings.

5.4 Creating a Lens File

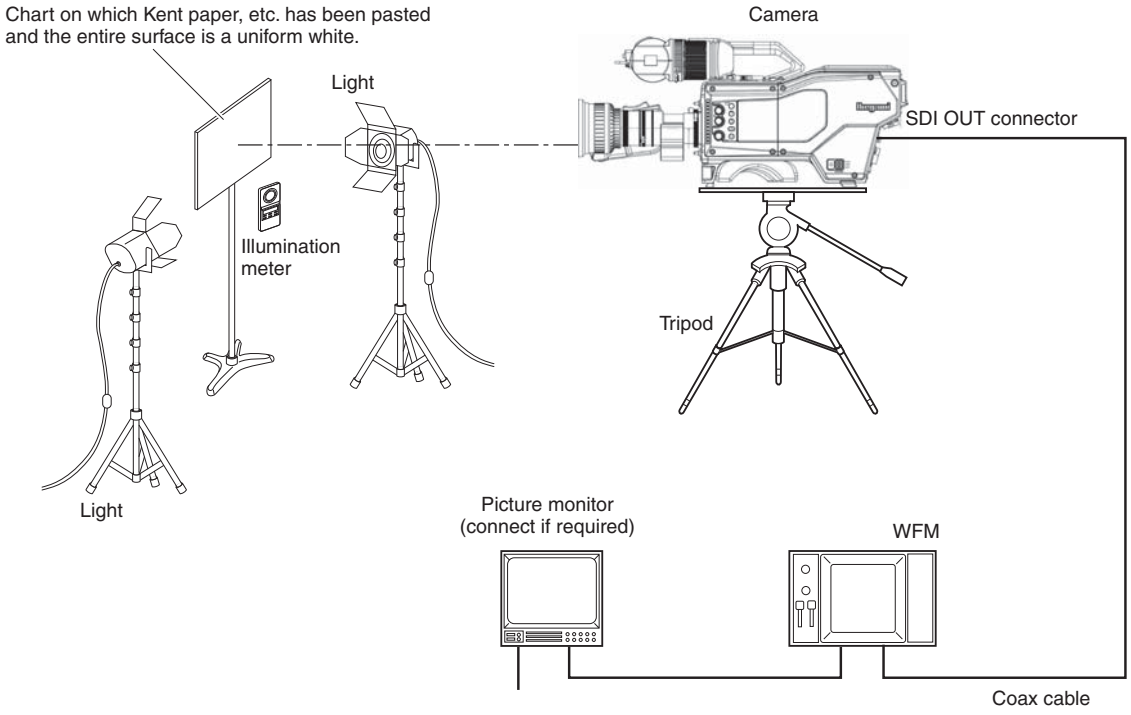
The purpose of creating a lens file is to save the changes in a color balance due to the optical properties of the lens. Gain and W.Shading can be optimized even if a lens with a different magnification and manufacturer is used. Just selecting the lens number on the menu can change the lens file, so readjustment is not necessary each time. Also, it can save the correction for the extender and automatically change it by the answer signal from the lens.
Sixteen lenses can be registered per camera so that lens files can be created when a prompter or external filter is used.

■ *Preparation for creating a lens file*

Install a "standard lens" to the camera as a reference. Also use a uniform white chart (for example, white paper as the subject) and adjust the lighting using a light meter to make sure the brightness of the entire chart is uniform.

Note:

- To create a lens file, set the optical filter to ND:CLEAR (100%), and the CC filter to 3200K. Make sure that a special effect filter is not installed on the front of lens or built-in filter disk. If a special effect filter is installed, the lens file may not be created properly.
- When creating the lens files, gather all target lenses and create files at the same time under the same condition. If the condition is changed while creating the files, correct settings cannot be obtained. The lens file stores the level deviation between lenses, so if the lighting or chart is changed, it is impossible to identify whether the deviation is due to the lens or lighting/chart.



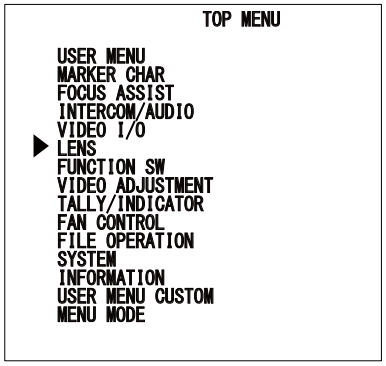
■ *Creating the lens OFF file*

Create a "lens OFF file" that is a lens file for a standard lens. The lens OFF file provides a reference value for creating additional lens file.

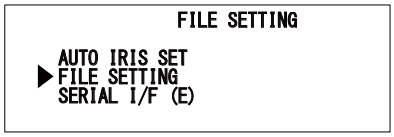
1 Display the ENGINEER MENU screen to select "LENS" and press the ENTER button.

Caution:

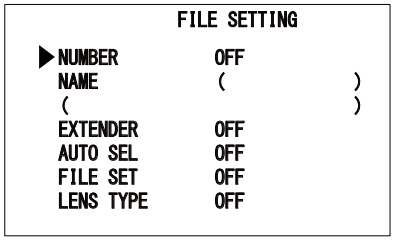
When creating the lens file, set the ENGINEER MENU to ON. Please refer to "5.2 Basic operation of the menu screen" for the ENGINEER MENU setting.



2 Select "FILE SETTING" on the SUB MENU screen and press the ENTER button.

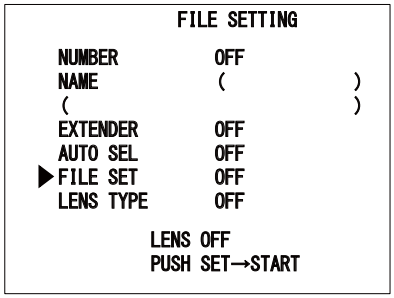


3 Select "OFF" for "NUMBER".



4 Select "AUTO" for "FILE SET", and then select "START".

The data acquisition starts. The creation of lens OFF file is completed when "COMPLETED" is displayed.



■ *Creating lens files*

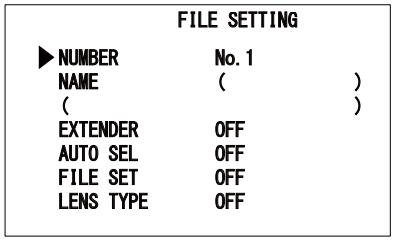
After the lens OFF file is created, lens files are created for each lens. The lens files created after this store differential data from this lens OFF file.
This section describes the setting method for serial interface supported lenses.

1 Display the ENGINEER MENU screen to select "LENS" and press the ENTER button.

2 Select "FILE SETTING" on the SUB MENU screen and press the ENTER button.

3 Select "No.1" for "NUMBER".

Select from No.1 - No.16.
Specify the number you want to set for NUMBER.
Note that assigning the same lens number overwrites the data.

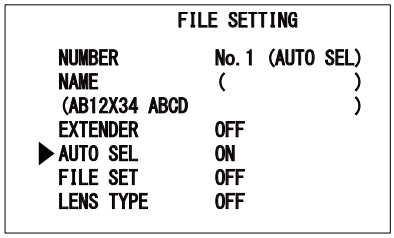


4 Select "ON" for "AUTO SEL".

Set the file name in "NAME" (1st row) for each lens file.
At this time, the information of "NAME" (2nd row) and "EXTENDER" are automatically acquired.

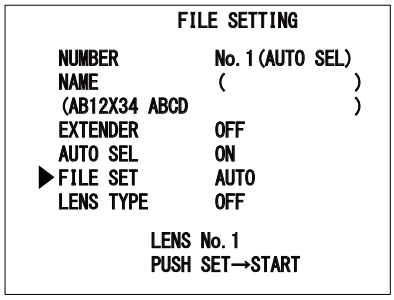
Note:

There are two display types for lens file names.
- Set the file names of the first row (NAME section) to manually input for each lens file. Giving the lens type name, etc. makes it easier to find the lens No. and lens compatibility.
- In the case of serial interface supported lens, the model name automatically acquired from the lens is displayed for the file name of the second row (AUTO SEL NAME display section). This model name is acquired when the lens file is created and stored by the lens file number.



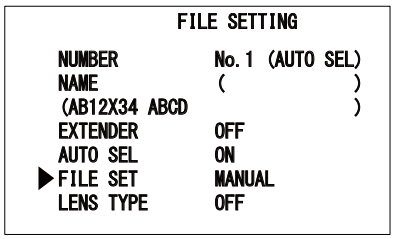
5 Select "AUTO" for "FILE SET", and then select "START".

The data acquisition starts.
Now the lens files have been created.



Note:

Gain and W.Shading can be adjusted manually. After adjusting OCP and MCP, the lens file can be created by selecting "MANUAL" under "FILESET".



5.5 Using the USB memory

The USB memory can be used to store/read the setting condition of the camera.

Caution:

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

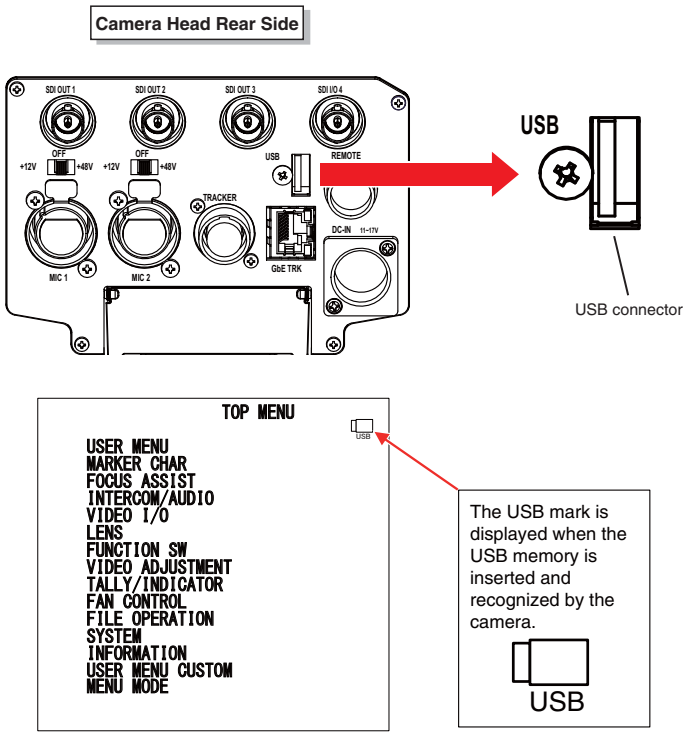
The password-protected USB may not be recognized.

■ *Inserting and removing the USB memory*

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

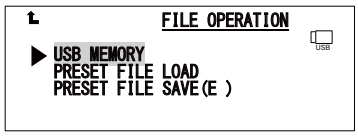
Caution:

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



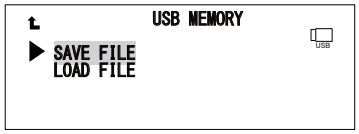
■ *Saving the Setting Status of Camera to the USB Memory*

1 Use the menu select knob in the "MAIN MENU" to move the cursor to "FILE OPERATION". Then press the SET button to display the "FILE OPERATION" sub menu.



2 Select "USB MEMORY" and press the SET button.

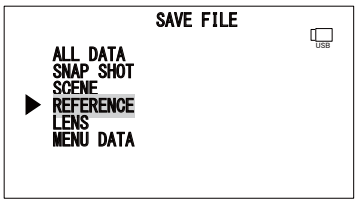
Display the sub menu of "USB MEMORY".



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

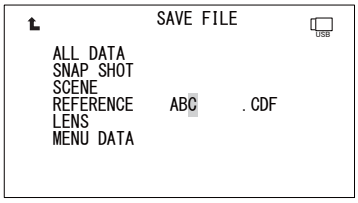
In the figure, "SAVE FILE" is selected to save the file.

4 Select the items you wish to save, and then press the SET button.

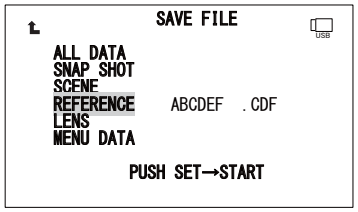


5 Use the menu select knob and the SET button to set the file name with 8 characters.

Turn the Menu selection knob at the flashing character position. Then, select the desired character and press the SET button. When the SET button is pressed, it moves to the next character.

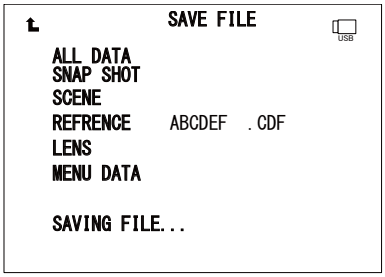


6 When the file name is confirmed, the screen returns to the "SAVE FILE" screen and "PUSH SET→ START" is displayed. Then, press the SET button. If a file with the same name exists in the USB memory, go to the Procedure "M1". To cancel the saving process, turn the menu select knob when "PUSHSET→ START" is displayed. Then select "CANCEL" and press the SET button.



continues to the next page

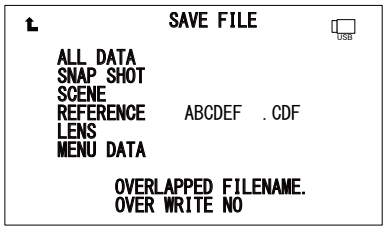
7 When the file is being saved, [SAVING FILE...] is displayed.
If the file is saved normally, [COMPLETE] is displayed.



Caution:

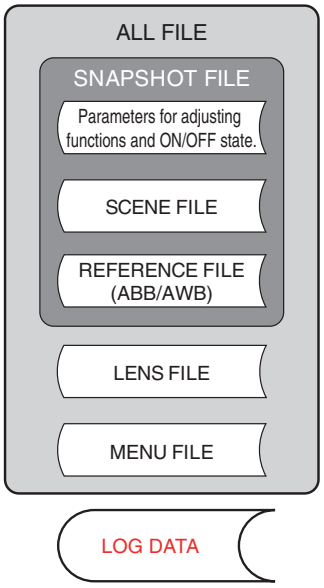
Never remove the USB memory from the slot during display of [SAVING FILE] or while the access indicator is lighted, as data is being written to the USB memory. Removing it at this time could damage the USB memory data or the USB memory itself.

M1 If a file with the same file name exists on the USB memory, 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.



■ *The setting status of the camera loaded from the USB memory.*

Read the camera setting condition from the USB memory.

1 Use the menu select knob in the "MAIN MENU" to move the cursor to "FILE OPERATION". Then press the SET button to display the "FILE OPERATION" sub menu..

2 Select "USB MEMORY" and press the SET button.

Display the sub menu of "USB MEMORY".

3 Select the operation items performed from the sub menu of "USB MEMORY".

Select "LOAD FILE" to load the file.

4 Select the items you wish to load from the sub menu of LOADFILE.

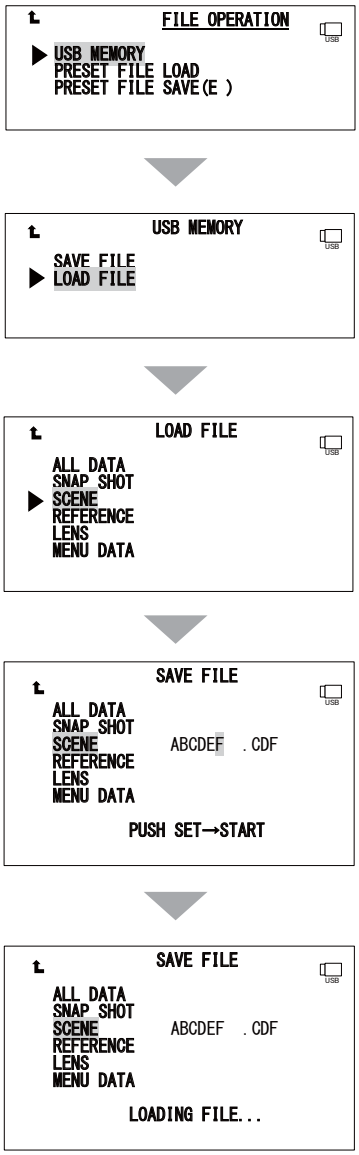
In the figure, select "SCENE" and press the SET button.

5 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 USB memory.
After the contents are determined, [PUSH SET -> START] is displayed. Press the SET button.
If you wish to cancel, turn the menu select knob 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

6 When the file is being saved, [LOADING 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 USB memory from the slot during display of [LOADING FILE] or while the access indicator is lighted, as data is being written to the USB memory. Removing it at this time could damage the USB memory data or the USB memory 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 Message*

If an error occurs during saving and loading data, following various error messages are displayed.

Error Message	Contents
NO CARD	Memory card is not inserted.
CANNOT OPEN FILE	Cannot open the file.
NOT CAMERA DATA FILE.	This data file is not for this camera.
FILE OF DIFFERENT CAMERA.	This file is for another model.
RELEVANT DATA IS NOT FOUND.	No related data found.
WIRTE ERROR	Writing error.
READ ERROR	Reading error
ERROR	Other error

5.6 Setting the Items Controlled from OCP

Selecting the Shutter Speed

There are two types of shutter functions: One is "Preset Shutter" in which the shutter speed is set in advance, and the other is "Variable Shutter" in which the shutter speed is arbitrarily set.

① Preset Shutter : The shutter speed can be set (1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000).
② Variable Shutter : The shutter speed can be arbitrarily set within the following range.
- 1/60.2 - 1/2040 seconds (Scanning system :59.94Hz)
- 1/50.2 - 1/2000 seconds (Scanning system :50Hz)

The variable shutter is suitable in the situations when shooting a PC screen, etc., that is not synchronized with TV, or when shooting a subject moving at high speed such as golfer swinging and later playing the video in slow motion. By setting the shutter speed at high speed, you can shoot quick-moving subjects at high resolution in sport coverage and broadcasting, etc. However, as the shutter speed increases, the interval you can set will be longer.

■ *Setting from the OCP-300*

This section describes the setting method of shutter speed for OCP-300.

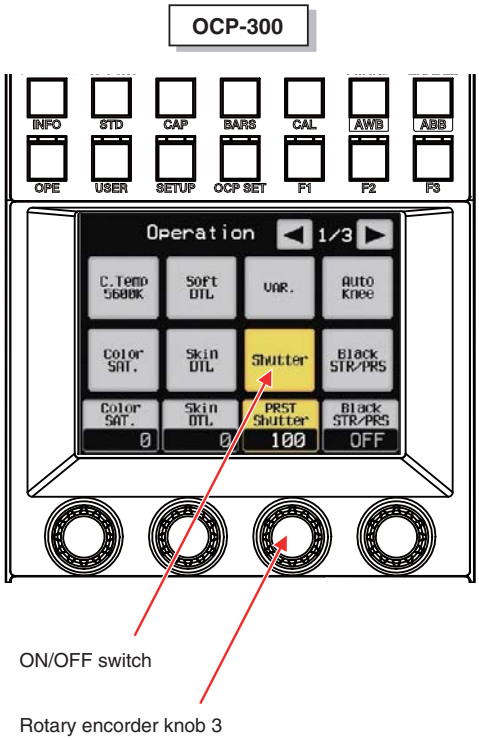
1 Press the "OPE" switch of OCP-300.

2 "Operation" appears on the OCP LCD screen, and the items related to "Shutter" appears in the Page "1/3".

3 Select "VAR." (Variable Shutter), "SUTTER" or "PRST Shutter" (Preset Shutter).

Note

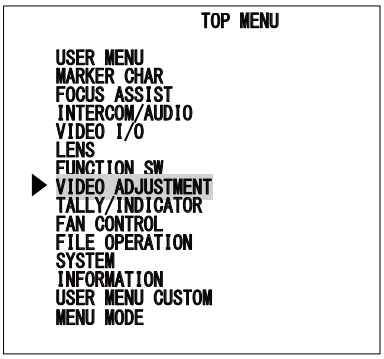
As the shutter speed increases, the sensitivity decreases, so it is necessary to ensure sufficient lighting conditions.



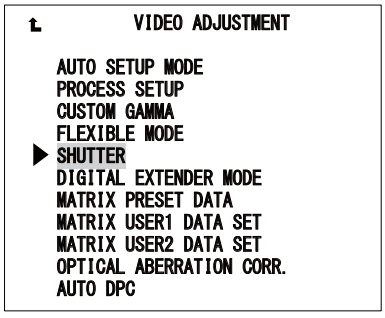
■ *Setting from the Menu Screen*

1 Press the "VF CHAR" button and ENTER button to display "MAIN MENU".

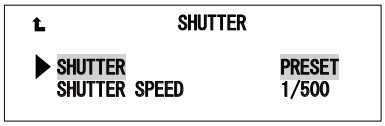
2 Use the menu select knob to select "VIDEO ADJUSTMENT", and then press the SET button.



3 Select SUHTTER" from the "VIDEO ADJUSTMENT" menu screen.



4 Set the shutter operation.



Setting the Digital Extender

Digital Extender can turn on/off the functions and set the magnification on the OCP-300 (Operation Control Panel), but it can also perform the settings from the menu screen.

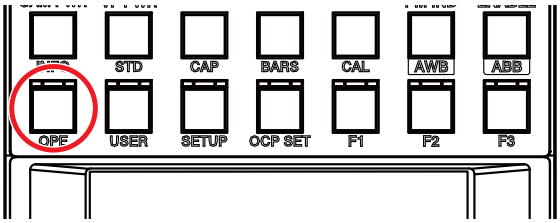
■ *Setting from the OCP-300*

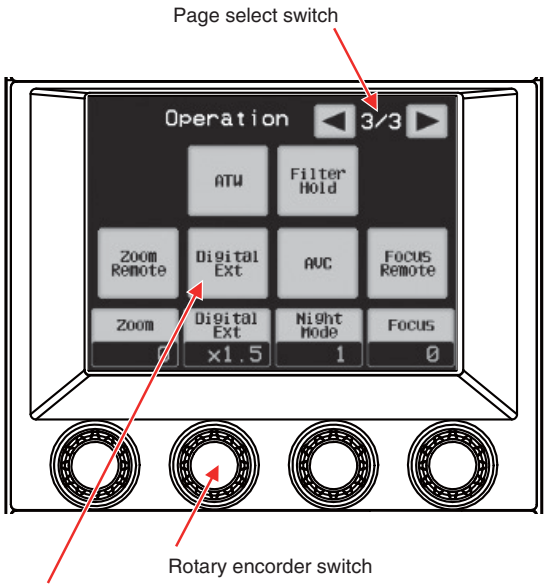
1 Select "OPE" from the FUNCTION switches of OCP-300.

2 Operate "◀▶" on the upper right of the LCD screen to display Operation page "3/3".

3 Turn the rotary encoder knob 2 of OC-300P to select the magnification of digital extender. Select the magnification from "×1.5", "×2", "×3", or "×4".

4 Turn it on/off with "Digital Ext" on the LCD screen.

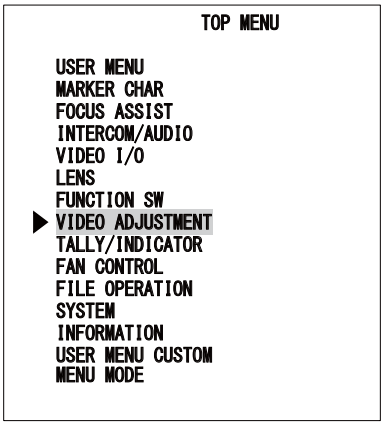




■ *Setting from the Menu Screen*

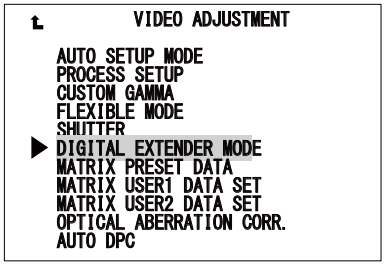
1 Press the "VF CHAR" button and ENTER button to display "MAIN MENU".

2 Use the menu select knob to select "VIDEO ADJUSTMENT", and then press the SET button.

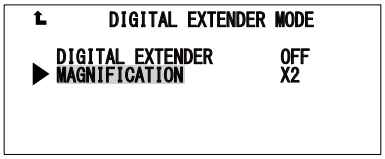


continues to the next page

3 Select "DIGITAL EXTENDER MODE" from the "VIDEO ADJUSTMENT" sub menu screen.



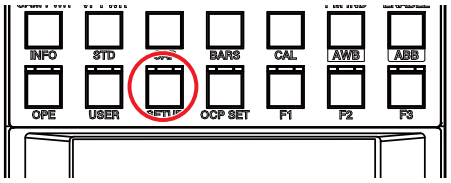
4 Select "MAGNIFICATION" from the "DIGITAL EXTENDER MODE" sub menu to set the magnification.



Switching the Video Gain (Step Gain)

If shooting in the evening or night, or in the conditions (in a room, etc.) where the light is not sufficient, switch the gain (sensitivity) of the camera according to the brightness of the subject. It can be switched from OCP-300 (Operation Control Panel).

1 Press the "SETUP" switch among the FUNCTION switches of OCP-300 to display the "SETUP" screen (1/2) on the OCP-300 LCD screen.



2 Select "ON/OFF CTRL" from the "SETUP" screen (1/2) to display Page 1/6.

3 Use the "◀▶" switch on the LCD screen to display Page 6/6.

4 Turn the rotary encoder knob under the "GAIN" display on the LCD screen to select the step gain.

The step gain is selected from the following: "-6dB", "-3dB", "0dB", "3dB", "6dB", "9dB", "12dB"

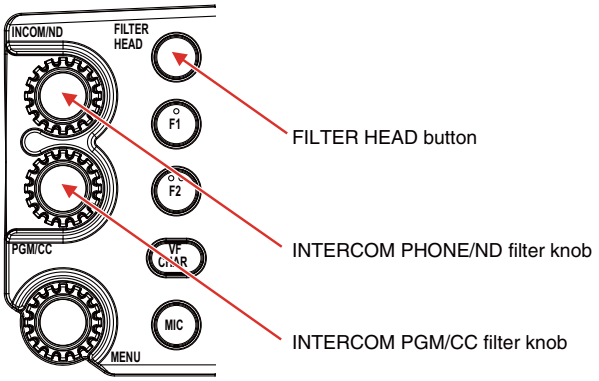
Caution

Setting the step gain exceeding "12dB" is an optional item. So, it may not be operable.

5.7 Controlling from the Camera

Controlling the ND Filter and Color Filter

Camera Right Side



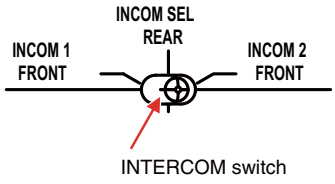
1 Press and hold the FILTER HEAD button to switch the FILTER control to the camera side.

The FILTER HEAD button lights up, which indicates that the control is transferred to the camera. The FILTER position is passed on as it is.

2 INTERCOM selector switch is set to "INTERCOM SEL REAR".

Operate "INTERCOM PHONE/ND Filter knob" or "INTERCOM PGM/CC Filter knob" to perform the FILTER control.

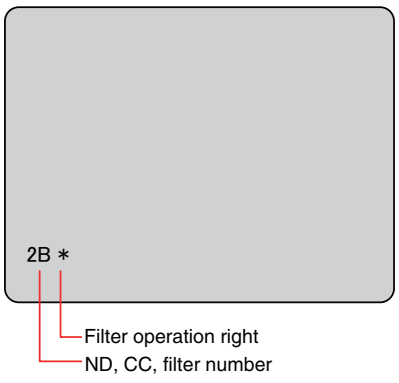
Camera Rear Side



3 INTERCOM selector switch is set to "INCOM1 FRONT" or "INCOM2 FRONT".

(1) Press the FILTER knob to operate ("INTERCOM PHONE/ND Filter knob" or "INTERCOM PGM/CC Filter knob").
(2) Display the FILTER information (FILTER number, filter operation right) on the VF screen for 3 seconds.
Perform the FILTER control in these 3 seconds.
(3) If the FILTER operation is not performed for 3 seconds, the FILTER information on the VF screen disappears. Then "INTERCOM PHONE/ND Filter knob" or "INTERCOM PGM/CC Filter knob" is reset to the INTERCOM control.
(4) Repeat (1) to (3) to perform the FILTER operation again.

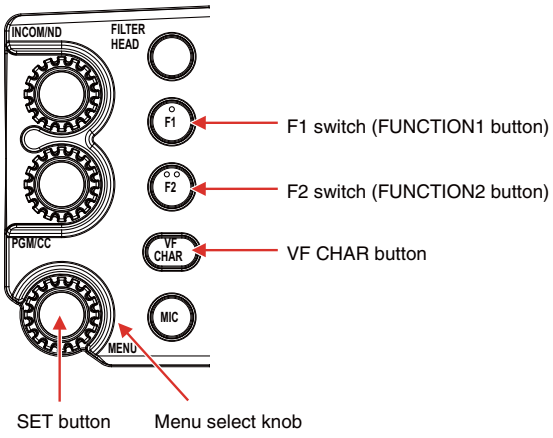
Viewfinder display



Assigning Functions to FUNTION Buttons

Users can set buttons for their preference. Assigning the functions that are frequently used to these buttons can increase the usability of user interface.

■ *Assigning the FUNTION Switch on the Right Side of the Camera*



1 Press the "VF CHAR" button and ENTER button to display MAIN MENU (TOP MENU).

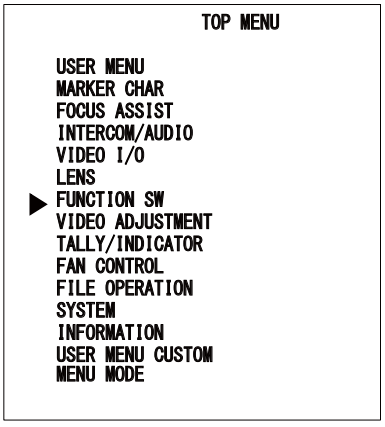
2 Use the menu select knob to select "FUNCTION SW", and then press the SET button.

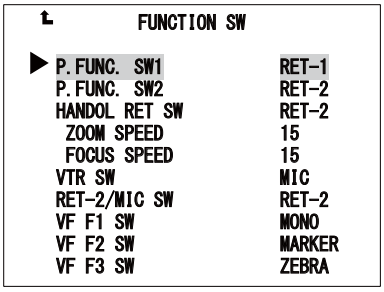
3 Use the menu select knob to temporarily select "P.FUNC SW1" from "FUNCTION" sub menu screen, and then press the SET button.

4 The blinks of characters are moved to the field of setting values.

5 Use the menu select knob to select the setting values, and then press the SET button.

6 Set "P.FUNC SW2", "HANDOL RET SW" and "VTR SW" in the same way.

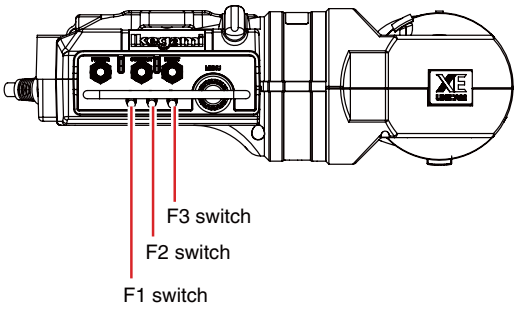




■ *Assignment of the FUNTION buttons of Viewfinder*

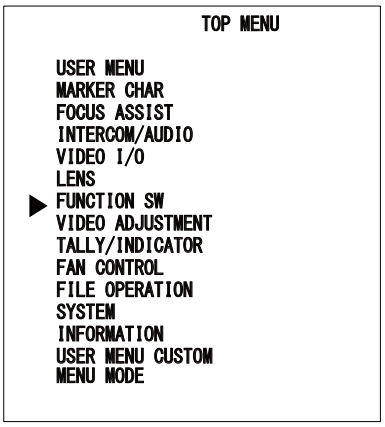
Assign functions to the FUNCTION switches of the viewfinder.

VFL201D



1 Press the "VF CHAR" button and ENTER button to display MAIN MENU (TOP MENU).

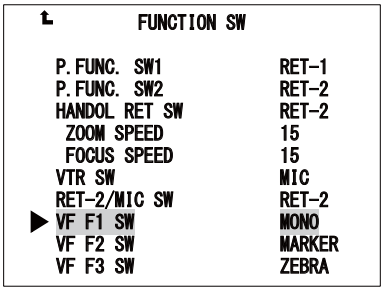
2 Use the menu select knob to select "FUNCTION SW", and then press the SET button.



3 Use the menu select knob to temporarily select "VF F1 SW" from "FUNCTION" sub menu screen, and then press the SET button.

4 The blinks of characters are moved to the field of setting values.

5 Use the menu select knob to select the setting values from "MONO", "USRMAK", "WFM", etc., and then press the SET button.



6 Set the rest in the same way as "VF F2 SW" and "VF F3 SW".

Reference

Please refer to "FUNCTION button" page in **"5.3 Menu Configuration and content" "FUNCTION SW" (P. 100)** for setting items that assign functions to the function switch.

CCU SETTINGS and ADJUSTMENT

6

6.1 Basic Operation of Menu Screen

The menu operation on setting the CCU is performed from the controlpanel or the CCU by itself.
The setting of each item is performed by displaying the main menu/submenu screen on the PM screen. The CCU menu is displayed only PM OUT output.

Note:

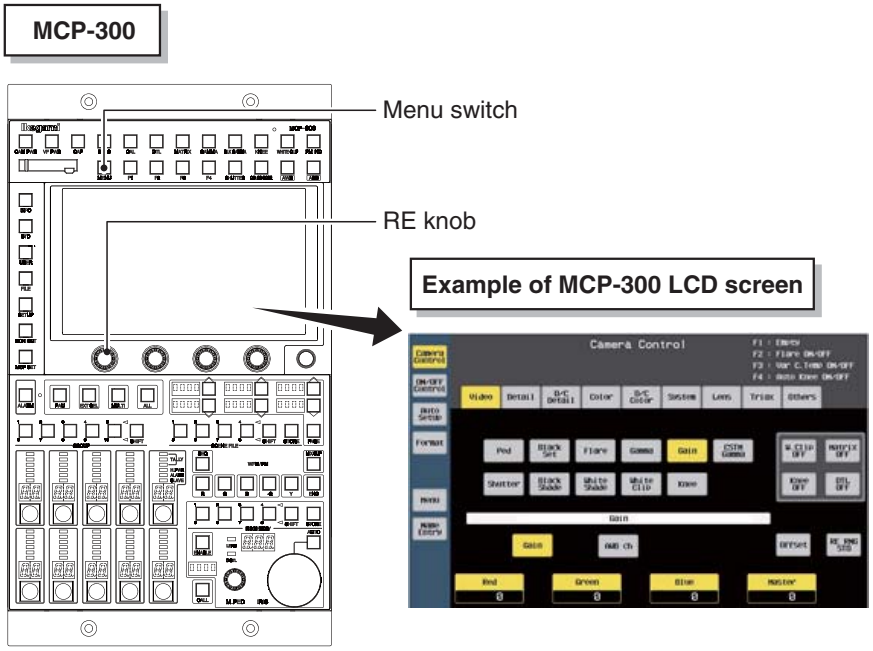
Abbreviations
PM : Abbreviation of Picture Monitor
PM screen : PM screen: Monitor video output screen of the CCU. PM screen superimposes and displays various character information.

Basic Operation of Menu Screen

The following methods may be used to display and operate the main menu screen of the CCU on the monitor screen.
- Operate from MCP-300.
- Operate from OCP-300.
- Operate from the front panel of the CCU.

Each operation is described below.

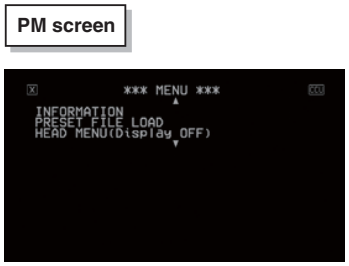
■ *Operating from MCP-300*



Press and hold the Menu switch of MCP-300 to display the main menu on the monitor screen (PM screen).
The monitor output screen superimposes the character information to the camera video output.

Note:

RE knob: Means the Rotary Encoder knob.



The following explains the method to display the main menu on the PM screen.

1 Press and hold the MENU switch of MCP.

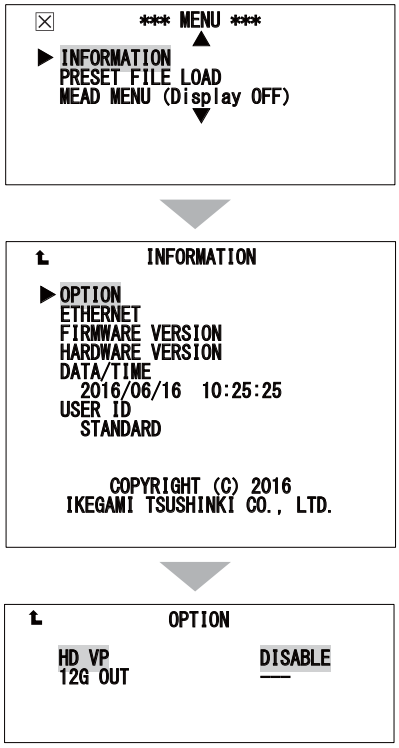
Display the main menu on the PM screen.

2 Turn the RE knob under "Select" and "Next" of MCP to change the item. Then press the Enter switch in the MCP LCD screen and confirm.

Display the sub menu selected and perform various settings

3 Turn the RE knob under "Select" and "Next" of MCP on the sub menu screen to select the item. Then press the Enter switch in the MCP LCD screen. Move to the setting screen. (The sub menu may be continued for some items.)

4 On the setting screen, select the item and confirm (press the Enter switch). Then, turn the RE knob of the MCP screen to select the setting value.



CAUTION:

Depending on the functions of the setting items, some items change the setting when the knob is turned; others change the setting when the CALL button is pressed.

Note:

- To return to the main menu, select "↰" and press the CALL button.
- The flashing item on the submenu indicates the currently focused item. This flashing status is called the "flashing cursor" hereafter (displayed in gray in the display example).
- Each time the CALL button is pressed, the flashing cursor switches to setting item -> mode selection -> setting item -> mode selection and so on.

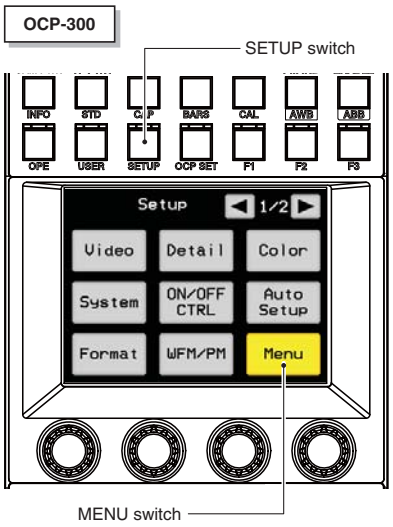
5 Exiting the nemu.

Exit the main menu screen and sub menu screen displayed on the PM screen by following one of the methods described below.

- Select "☒" on the CCU main menu and press the CALL button.

■ *Operating from OCP-300*

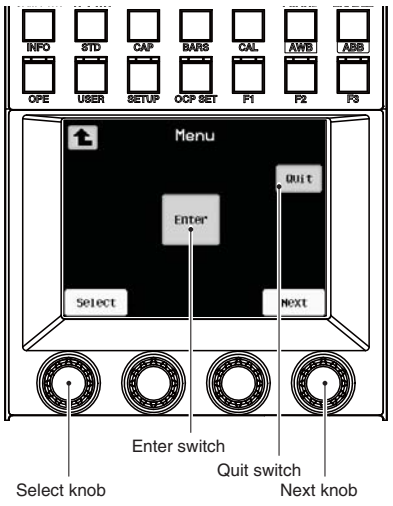
1 Press the "SETUP" switch of OCP-300 to display the SETUP items on the OCP LCD screen.



PM screen

2 Press and hold the MENU switch to display the menu screen on the PM screen.

You can perform various settings on the submenu that is displayed from the main menu on the PM screen.



3 Make sure that the main menu screen is displayed on the PM screen.

4 Turn the Select knob or Next knob to position the flashing cursor on the setting item, and press the Enter switch on the LCD.

The submenu appears, on which you can perform various settings.

Note:

Depending on the functions of the setting items, some items change the setting when the knob is turned; others change the setting when the Enter switch on the LCD is pressed.

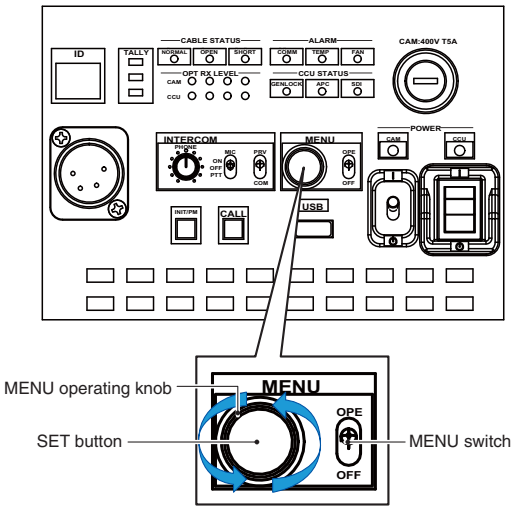
5 Exiting the nemu

Exit the menu screen in the any of the following methods.
- Select "☒" on the CCU main menu and press the Enter switch.
- Press the QUIT switch on the LCD.

■ *Operating from CCU Main Unit*

1 Set the MENU switch "OPE - OFF" to "OPE" side.

2 When the MENU operation dial is kept pressed for approximately three seconds, the Main menu screen is displayed on the PM screen.



3 Check that the main menu screen is displayed on the PM screen, and turn the MENU operating knob to move the flashing cursor to the setting item. Then, press the knob (SET button).

PM screen

4 Display the sub menu, and perform various settings.

Turn the knob to select items and press to confirm.

Caution:

Depending on the function of the setting item, there are items that the setting is changed when the dial is turned or when the SET button is pressed.

5 Exit the menu screen in the any of the following methods :

- Select "☒" on the CCU main menu and press the Enter switch.
- Set the MENU switch "OPE - OFF" to the "OFF" side (CCU).

6.2 CCU Menu Configuration and Contents

Various setting items performed on the CCU side are displayed.

■ *Sub Menu Setting Items*

(1) INFORMATION
Provides technical information (hardware and firmware versions, operating status) of the camera and CCU.

(2) PRESET FILE LOAD
Used to reset the operating status to the initial setting or engineer setting.

(3) CAMERA MENU
Remote operating the settings of the camera side on the CCU side.

Note:
Please refer to Chapter 5 for this item.

(4) SYSTEM SETTING (1/2)
Sets the operation settings of the camera output. This item sets the settings relating to other video devices. Therefore, this item is not for daily operation.

(5) SYSTEM SETTING (2/2)
Performs various settings for settings of video processing and synchronization phase, and connections to INTERCOM and other devices.

(6) CONFIGURATION
Sets the external connection settings, etc.

Caution:
Some of operations may be different from this manual due to improvements. Please note that some of operations may be different from this manual due to improvements.

■ *INFORMATION*

Provides technical information (hardware and firmware versions, operating status) of the camera and CCU.

Setting Item	Initial setting	Setting value	Description, Remarks
INFORMATION			Displays the each setting information.
OPTION			
HD_VP	DISABLE	DISABLE/ENABLE	Displays DISABLE/ENABLE of the option board and software options implemented.
12G_OUT	DISABLE	DISABLE/ENABLE	
. . .			
. . .			
ETHERNET			Displays the setting values of ETHERNET.
IP ADDRESS			
SUBNET MASK			
DEFAULT GATE WAY			
SPEED/DUPLEX			
MAC ADDRESS			
FIRMWARE VERSION			
CCU SERIAL NUMBER	AB24378E		Displays the serial number and firmware information of the device.
PACKAGE VERSION	6182V**.**.**		
MAIN SOFT	6149Vxx.yy.zz(C/S)		
SUB SOFT	6139Vxx.yy.zz(C/S)		
HD_VP FPGA2	6091Vxx.xx	*1 Option module	
HD_VP FPGA3	6093Vxx.xx	*1 Option module	
TRX_VP FPGA1	6089Vxx.xx		
TRX_VP FPGA2	6090Vxx.xx		
TRX_VP FPGA3	6093Vxx.xx		
RET_PRC FPGA1	6102Vxx.xx		
RET_PRC FPGA2	6103Vxx.xx		
PLS/AUX FPGA	6115Vxx.xx		
PLS/AUX CPLD	6116Vxx.xx		
MPU FPGA	6117Vxx.xx		
S12G_OUT FPGA	6128Vxx.xx	*1 Option module	
HARDWARE VERSION			Displays the hardware version.
HD_VP	VERSION*	*1 Option module	
TRX_VP	VERSION*		
RET_PRC	VERSION*		
PLS/AUX	VERSION*		
MPU	VERSION*		
12G_OUT	VERSION*	*1 Option module	
DATE/TIME	YYYY/MM/DD hh:mm		Displays and sets the date and time.
DATE SET	20YY/MM/DD		Date setting (Year/Month/Day)
TIME SET	hh:mm:ss		Time setting (24 hours)
PUSH SET ---> START			Executes the date and time setting.
INTEGRAL TIME	*****H**M		Displays the integral operation time.
SUB TIME	*****H**M		Displays the interval operating time (resettable).
SUB TIMERE SET --->			Resets the interval operating time.
USER ID	STANDARD		Displays the USER ID settings.

Caution:

*1: Option module

Displays the information on the option board and software options implemented. If they are not implemented, they are indicated with "---" or no display.

■ *DIAGNOSIS*

Monitors various modules and elements and displays the results.

Setting Item	Initial setting	Setting value	Description, Remarks
TEMPERATUR			Displays the temperature information (Celsius) of the device.
HD_VP			
FPGA2	xx.x		
FPGA3	xx.x		
ASIC L	xx.x		
ASIC R	xx.x		
TRX_VP			
FPGA1	xx.x		
FPGA2	xx.x		
FPGA3	xx.x		
ASIC L	xx.x		
ASIC R	xx.x		
OPT T/R	xx.x		
RET_PRC			
FPGA1	xx.x		
FPGA2	xx.x		
PLS/AUX	xx.x		
MPU	xx.x		
POWER_IF	xx.x		
12G_OUT			
FPGA	xx.x		
OPT RX CONDITION			Displays the LOS FLAG status of optical transceiver.
Rx1 LOS FLAG	OK	OK/LOS	
Rx2 LOS FLAG	OK	OK/LOS	
Rx3 LOS FLAG	OK	OK/LOS	
Rx4 LOS FLAG	OK	OK/LOS	
TRX_VP CRC			Displays the results obtained by CRC monitoring of TRX_VP module.
GROUP 1 R/G/B	OK/ OK/ OK	OK/ERROR	
GROUP 2 R/G/B	OK/ OK/ OK	OK/ERROR	
GROUP 3 R/G/B	OK/ OK/ OK	OK/ERROR	
GROUP 4 R/G/B	OK/ OK/ OK	OK/ERROR	
GROUP 5 R/G/B	OK/ OK/ OK	OK/ERROR	
GROUP 6 R/G/B	OK/ OK/ OK	OK/ERROR	
GROUP 7 R/G/B	OK/ OK/ OK	OK/ERROR	
GROUP 8 R/G/B	OK/ OK/ OK	OK/ERROR	
CAM_MON/VF	OK	OK/ERROR	
HD QTV	OK	OK/ERROR	
RET VIDEO-A	OK	OK/ERROR	
RET VIDEO-B	OK	OK/ERROR	
RET_PRC CRC			Displays the results obtained by CRC monitoring of RET_PRC module.
RET-1	OK	OK/ERROR	
RET-2	OK	OK/ERROR	
RET-3	OK	OK/ERROR	
RET-4	OK	OK/ERROR	
QTV-1	OK	OK/ERROR	
QTV-2	OK	OK/ERROR	
4K EDGE	OK	OK/ERROR	
D/C_VF	OK	OK/ERROR	
HD TRK	OK	OK/ERROR	

Setting Item	Initial setting	Setting value	Description, Remarks
FAN CONDTION			Displays the monitoring results of FAN motor for cooling.
FAN1(REAR)	OK	OK/NG	Position of the back side of POWER BLOCK
FAN2(FORFRONT)	OK	OK/NG	Position of the front side of POWER BLOCK
FAN3(CENTER)	OK	OK/NG	Position of the center of POWER BLOCK
FAN4(INNERMOST)	OK	OK/NG	Position of the rear side of POWER BLOCK
BATTERY CONDITIO			Displays the status of the battery for BACKUP.
MPU BATTERY	OK	OK/NG	
TRX_VP BATTERY	OK	OK/NG	
AC VOLTAGE SELECTOR		100V/110-120V/ 220-240V	Displays the setting status of CCU input AC voltage.

■ *PRESET FILE LOAD*

Used to reset the operating status to the initial setting or engineer setting.

Setting Item	Initial setting	Setting value	Description, Remarks
PRESET FILE LOAD			
FILE SELECT	ENGINEER-1	ENGINEER-1/-2/-3/ FACTORY	
LOAD START	READY	START / CANSEL	
PUSH SET → START			
CAMERA MENU			Displays "Camera Power OFF" when the power of camera is turned off.

■ *SYSTEM SETTING (1/2)*

Sets the operation settings of the camera output. This item sets the settings relating to other video devices.

[CCU OUTPUT]

Setting Item	Initial setting	Setting value	Description, Remarks
CCU OUTPUT	CAMERA	CAMERA / COLOR BARS	Selects video output of CCU.
OUT-1 FORMAT	4K 59.94P 422 LVL-A 3G-QL 2SI	Displays the current values.	Sets the video format of CCU output.
— IMAGE SIZE	3840x2160	3840x2160 / 1920x1080 / 1280x720	Selects IMAGE SIZE.
— FREQ&SCAN	59.94P	59.94P / 29.97P / 29.97PsF / 23.98P / 23.98PsF / 50P / 25P / 25PsF / 24P / 24PsF / 59.94I / 50I / 119.88P / 100P	Selects the frame rate and scanning method.
— SAMPLING	YCbCr 4:2:2	YCbCr 422 / RGB 444	Selects the sampling method.
— MAPPING	3G-SDI LVL-A	3G-SDI LVL-A / 3G-SDI LVL-B / HD-SDI	Selects the SDI mapping.
— 4K OUTPUT	3G QL 2SI	3G QL 2SI / 3G QL SQD / 12G-SDI / HD QL SQD	Selects the 4K output method.
— FORMAT CHANGE	READY	EXECUTE / CANCEL	Reflects the above settings.
OUT-2 FORMAT	SAME AS OUT-1	SAME AS OUT-1 / INDIVIDUAL	The selection item is determined by OUT-1 format.
— IMAGE SIZE	3840x2160	3840x2160 / 1920x1080 / 1280x720	Selects IMAGE SIZE.
— FREQ&SCAN	59.94P	59.94P / 29.97P / 29.97PsF / 23.98P / 23.98PsF / 50P / 25P / 25PsF / 24P / 24PsF / 59.94I / 50I / 119.88P / 100P	Selects the frame rate and scanning method.
— SAMPLING	YCbCr 4:2:2	YCbCr 422 / RGB 444	Selects the sampling method.
— MAPPING	3G-SDI LVL-A	3G-SDI LVL-A / 3G-SDI LVL-B / HD-SDI	Selects the SDI mapping.
— 4K OUTPUT	3G QL 2SI-1	3G QL 2SI / 3G QL SQD / 12G-SDI / HD QL SQD	Selects the 4K output method.
— FORMAT CHANGE	READY	EXECUTE / CANCEL	Reflects the above settings.
OUT-3 FORMAT	1080P59.94 422 3G-SDI LVL-A	Displays the current values.	Displays when the HD_VP option is implemented. The setting items are determined based on the OUT-1 FORMAT settings.
— IMAGE SIZE	1920x1080	1920x1080 / 1280x720	Selects IMAGE SIZE.
— FREQ&SCAN	59.94P	59.94P / 29.97P / 29.97PsF / 23.98P / 23.98PsF / 50P / 25P / 25PsF / 24P / 24PsF / 59.94I / 50I / 119.88P / 100P	Selects the frame rate and scanning method.
— SAMPLING	YCbCr 4:2:2	YCbCr 422 / RGB 444	Selects the sampling method.
— MAPPING	3G-SDI LVL-A	3G-SDI LVL-A / 3G-SDI LVL-B / HD-SDI	Selects the SDI mapping.
— FORMAT CHANGE	READY	EXECUTE / CANCEL	Reflects the above settings.
OUT-4 FORMAT	SAME AS OUT-3	SAME AS OUT-3 / INDIVIDUAL	Displayed only when the optional HD_VP is implemented. OUT-1 format determines which formats and items can be set.
— IMAGE SIZE	1920x1080	1920x1080 / 1280x720	Selects IMAGE SIZE.
— FREQ&SCAN	59.94P	59.94P / 29.97P / 29.97PsF / 23.98P / 23.98PsF / 50P / 25P / 25PsF / 24P / 24PsF / 59.94I / 50I / 119.88P / 100P	Selects the frame rate and scanning method.
— SAMPLING	YCbCr 4:2:2	YCbCr 422 / RGB 444	Selects the sampling method.
— MAPPING	3G-SDI LVL-A	3G-SDI LVL-A / 3G-SDI LVL-B / HD-SDI	Selects the SDI mapping.
— FORMAT CHANGE	READY	EXECUTE / CANCEL	Reflects the above settings.

<< SYSTEM SETTING (1/2) continues to the next page >>

[MONITOR OUT] [MONITOR BARS TITLE] [SYNC OUTPUT]

<< SYSTEM SETTING (1/2) continued >>

Setting Item	Initial setting	Setting value	Description, Remarks
MONITOR OUT			Sets the monitor output. The setting items are determined based on the main line OUT-1 format.
OUT-1	CCU PM OUT	CCU PM OUT / CCU VF OUT	
OUT-1 FORMAT	1080I59.94 422 HD-SDI	1080I59.94 422 HD-SDI/ 1080I50 422 HD-SDI 1080P29.97 422 HD-SDI/ 1080P29.97sF 422 HD-SDI 1080P23.98 422 HD-SDI/ 1080P23.98sF 422 HD-SDI 1080P25 422 HD-SDI/ 1080P25sF 422 HD-SDI 1080P24 422 HD-SDI/ 1080P24sF 422 HD-SDI 720P59.94 422 HD-SDI/ 720P50 422 HD-SDI	
OUT-2	CCU PM OUT	CCU PM OUT / CCU VF OUT	
OUT-2 FORMAT	1080I59.94 422 HD-SDI	1080I59.94 422 HD-SDI/ 1080I50 422 HD-SDI 1080P29.97 422 HD-SDI/ 1080P29.97sF 422 HD-SDI 1080P23.98 422 HD-SDI/ 1080P23.98sF 422 HD-SDI 1080P25 422 HD-SDI/ 1080P25sF 422 HD-SDI 1080P24 422 HD-SDI/ 1080P24sF 422 HD-SDI 720P59.94 422 HD-SDI/ 720P50 422 HD-SDI	
PM CHAR LEVEL	100	30 to 100	Sets the display level of character.
WARNING BIG CHAR	OFF	OFF / ON	Displays the DIAGNOSIS INFO. items in large font.
CAMERA STATUS DISP	OFF	OFF / ON	Displays the camera setting status on CCU PM.
POSITION	UPPER	UPPER LEFT / LOWER LEFT / UPPER RIGHT / LOWER RIGHT	Sets the display position of the camera setting status.
FILTER POSITION	ON	ON / OFF	Displays the position of optical filter on the monitor screen.
GAIN	ON	ON / OFF	Displays the setting value of Gain on the monitor screen.
IRIS	ON	ON / OFF	Displays the iris value on the monitor screen.
EXTENDER	ON	ON / OFF	Displays the ON/OFF of EXTENDER on the monitor screen.
SHUTTER	ON	ON / OFF	Displays the ON/OFF of SHUTER on the monitor screen.
CAM PGM NO.	ON	ON / OFF	Displays the CAM PGM No on the monitor screen.
VARIABLE COLOR TEMP	ON	ON / OFF	
MONITOR BARS TITLE			Superimposes characters to PM OUT COLOR BARS.
DISPLAY	OFF	OFF / ON	Sets the ON/OFF of the colorbar title display.
TITLE EDIT			Edits the characters of the colorbar title display.
POSITION			Sets the position of the colorbar title display.
SYNC OUTPUT	1080I59.94	1080I59.94 / 1080I50 / 1080P59.94 / 1080P50 / 1080P29.97 / 1080P29.97sF / 1080P23.98 / 1080P23.98sF / 1080P25 / 1080P25sF / 1080P24 / 1080P24sF / 720P59.94 / 720P50	Sets the format of the synchronization signals outputted from SYNC OUT (BNC) of CCU.

■ *Setting the SYSTEM SETTING (2/2)*

Performs various settings for settings of video processing and synchronization phase, and connections to INTERCOM and other devices.

[VIDEO PROCESS] [HD VIDEO PROCESS] [RET VIDEO FORMAT] [PHASE CONTOROL]

Setting Item	Initial setting	Setting value	Description, Remarks
VIDEO PROCESS			Sets the video systems.
UHDK 4K COLOR BARS	4K 709	4K 709 / ARIB UDH/ ARIB SIMPLIFIED	Selects UDH COLOR BAR.
HDTV COLOR BARS	SMPTE	SMPTE, ARIB, 100/100, 75/75	Selects HDTV Output COLOR BAR.
ARIB BARS TYPE	---	75% / 100% / +I	
SMPTE BARS TYPE	75%/0%	75%/0%, 100%/0%, +I/0%, -I/+Q	
HD VIDEO PROCESS			Sets the HDTV video system. *2
DOWN CONV FILTER	STD	STD, HI, HQ, LOW	Selects FIR-FILTER for converting 4K video to HD (1080i / 1080p).
HD CUTOUT	OFF	OFF, OUT-3, OUT-4, OUT-3/4	Sets the assignment of HD CUTOUT outputs. The lines for which CUTOUTS are not assigned are D/C outputs.
RET VIDEO SETTING			Sets the RETURN VIDEO. *3
RET1	FS OFF	FS ON/OFF	Sets the ON/OFF of FS (Frame Synchronization function).
RET2	FS OFF	FS ON/OFF	RET 2 is the output of RET-1 when ACTIVE-THROUGH is on.
RET3	FS OFF	FS ON/OFF	Sets the ON/OFF of FS (Frame Synchronization function).
RET4	FS OFF	FS ON/OFF	RET4 is the output of RET-3 when ACTIVE-THROUGH is on.
ACTIVE-THROUGH	OFF	OFF / ON	RET-2 is the output of RET-1, and RET-4 is the output of RET-3.
PHASE CONTROL			Adjusts the phases of video and synchronization signals.
4K V PHASE	0		
HD OUT-1 V PHASE	0		
HD OUT-2 V PHASE	0		
HD OUT-3 V PHASE	0		
HD OUT-4 V PHASE	0		
HD TRUNK V PHASE	0		
4K H PHASE	0		
HD OUT-1 H PHASE	0		
HD OUT-2 H PHASE	0		
HD OUT-3 H PHASE	0		A function that can be operated only when HD_VP is implemented.
HD OUT-4 H PHASE	0		A function that can be operated only when HD_VP is implemented.
HD PM H PHASE	0		
HD TRUNK H PHASE	0		
SYNC OUT V PHASE	0		Sets the vertical phase of the synchronization signal outputted from SYNC OUT(BNC).
SYNC OUT H PHASE	0		Sets the horizontal phase of the synchronization signal outputted from SYNC OUT(BNC).

<< SYSTEM SETTING (2/2) continues to the next page >>

Caution:

*2: This module performs simultaneous processing of HD video signals independent from 4K video signals. This module is optional.

*3: RETURN VIDEO input

- 3G-SDI/HD-SDI: Automatically recognizes the 2-rate signals.
- If ACTIVE-THROUGH function is used, both CCU and camera change to the Return 2 Channel specifications. The through output video signals will not be outputted unless the power of CCU is turned on.
- If FS (Frame Synchronizer) is turned on, and the input video signal format is switched to the signals that do not require FS, it is not automatically changed to "FS OFF". If FS is not required, turn it off manually.

[AUDIO SETTING] [MIC GAIN REMOTE] [INTERCOM SETTING]

<< SYSTEM SETTING (2/2) continued >>

Setting Item	Initial setting	Setting value	Description, Remarks
AUDIO SETTING			
4K EMBEDDED AUDIO	ON	ON / OFF	Sets the audio embed to the 4K SDI output.
HD EMBEDDED AUDIO	ON	ON / OFF	Not EMBEDDED to PM OUT.
MASTER DELAY	0	0 to 21	Sets the amount of master audio signal delay. The maximum delay amount is 2.5 FRAME.
EMB AUDIO DELAY	0	0 to 21	Sets the amount of EMBEDDED AUDIO delay. The maximum delay amount is 2.5 FRAME. (1ch/2ch/3ch/4ch)
AES/EBU DELAY	0	0 to 21	Sets the amount of AES/EBU delay. The maximum delay amount is 2.5 FRAME.
ANALOG OUT DELAY	0	0 to 21	Sets the amount of analog audio output delay. The maximum delay amount is 2.5 FRAME.
AUDIO-1 OUTPUT LEVEL	0dB	0dB / 4dB	Set the output level.
LEVEL ADJ (0dB)	265	1 to 1023	
LEVEL ADJ (4dB)	755	1 to 1023	
AUDIO-2 OUTPUT LEVEL	0dB	0dB / 4dB	Set the output level.
LEVEL ADJ (0dB)	265	1 to 1023	
LEVEL ADJ (4dB)	755	1 to 1023	
MIC GAIN REMOTE			*4
MIC1 CENTER SET	READY	EXECUTE / CANCEL / CLEAR	The center OFFSET adjustment of the EXT MIC GAIN REMOTE VR.
MIC2 CENTER SET	READY	EXECUTE / CANCEL / CLEAR	The center OFFSET adjustment of the EXT MIC GAIN REMOTE VR.
INTERCOM SETTING			Sets the intercom lines.
INTERCOM LINE	2LINE	2LINE / 1LINE	Sets the number of lines.
ENGINEER IF	4W	4W / RTS / CC	Links the settings of 4W/RTS/CC input/output. They can be set individually after being linked.
INPUT TERM	600	600 / 10k / ---	600 / --- / ---
OUTPUT LOAD	---	--- / OPEN / 200	--- / OPEN / OPEN
PRODUCER IF	4W	4W / RTS / CC	Links the settings of 4W/RTS/CC input/output. They can be set individually after being linked.
INPUT TERM	600	600 / 10k / ---	600 / --- / ---
OUTPUT LOAD	---	--- / OPEN / 200	--- / OPEN / OPEN
PGM1 TERM	600	600 / 10k	Sets the PROGRAM AUDIO.
PGM1 INPUT LEVEL	0dB	0dB / -20dB / 4dB	
PGM2 TERM	600	600 / 10k	
PGM2 INPUT LEVEL	0dB	0dB / -20dB / 4dB	
PGM3 TERM	600	600 / 10k	
PGM3 INPUT LEVEL	0dB	0dB / -20dB / 4dB	
FRONT INTERCOM MIC	DYNAMIC	DYNAMIC / CARBON / ECM	Sets the type of headset microphone of the entire CCU. * The ON/OFF of INTERCOM MIC POWER can be set only when ECM is selected. INTERCOM MIC POWER and its display are fixed to ON when CARBON is selected.
INTERCOM MIC POWER	---	ON / OFF	
PGM MIX	OFF	OFF / PGM1 / PGM2 / PGM3	
PGM LEVEL	X1.00	X0.00 to 2.00	

<< SYSTEM SETTING (2/2) continues to the next page >>

Caution:

*4: The control from the external MIC GAIN REMOTE PANEL has the highest priority.
- If the REMOTE ON/OFF switch of MIC GAIN REMOTE PANEL is turned on, the MIC GAIN control can be performed only from REMOTE PANEL.
- MIC1/2 CENTER ADJ function
  The MIC GAIN REMOTE function can continuously change the microphone gain of the camera from the potentiometer connected to the external device. However, the mechanical and electrical center value and the control power voltage may not match depending on the capability of potentiometer and individual variability. In this case, the MAX/MIN control level of the microphone gain of the camera is disproportionate to the center value.
  This function sets the mechanical center position of the potentiometer to the center of the control value.
  Normally, this is set to factory settings, so adjustment is not required. If "CENTER ADJ" is performed at the wrong position, the control range of the microphone gain becomes abnormal.

■ *CONFIGURATION*

Set the external connection etc..

[ETHERNET SETUP] [PGM NO.] [POWER CONTROL] etc.

Setting Item	Initial setting	Setting value	Description, Remarks
ETHERNET SETUP			Set the ETHERNET
IP ADDRESS	192.168. 1.100	0.0.0.0 - 255.255.255.255	
SUBNET MASK	255.255.255. 0	0.0.0.0 - 255.255.255.255	
DEFAULT GATE WAY	xxx.xxx.xxx.xxx	0.0.0.0 - 255.255.255.255	
SPEED/DUPLEX	AUTO NEGOTIATION	AUTO NEGOTIATION/10M HALF /10M FULL/100M HALF/100M FULL	
SET	REBOOT CANCEL	REBOOT CANCEL / REBOOT EXECUTE	
PGM NO.			Sets the program number.
CAM PGM NO. SET	OFF	OFF, 1 to 99	Sets the ID display number for the entire CCU front side.
FRONT ID DISPLAY	OFF	OFF / ON	Sets the ON/OFF of the display for the entire CCU front side.
POWER CONTROL			
OCP CAM PWR CTRL	---	--- / ON / OFF / LAST	Selects the operation mode based on the status of the OCP camera power switch.
CAM CODE	---	--- / NORMAL / CUT	Option by region(USA only)
SAFETY&H.PWR	---	--- / NORMAL / CUT	
FIBER SINGLE MODE	OFF	OFF / ON	Sets the fiber single mode.
ENGINEER SET FILE RENEW			Updates the ENGINEER SET FILE.
PASSWORD	****		Inputs the password for updating.
0123456789			
FILE SELECT	ENGINEER-1	ENGINEER-1 / ENGINEER-2 / ENGINEER-3	
DATA RENEW MODE			
PUSH SET --> RENEW			
PASSWORD ENTRY			Sets the password for updating the ENGINEER SET FILE.
INPUT	****	Input the current PASSWORD.	The initial value is 0000.
RENEW	****	New PASSWORD	
CONFIRM	****	Reconfirm	
123456789			
FIRMWARE UPDATE			Updates the firmware.
MAIN SOFT	6149Vxx.xx.xx		
ALL UPDATE	6182Vxx.xx.xx		
SUB SOFT	6139Vxx.xx.xx		
HD VP FPGA2	6091Vxx.xx.xx		Displays "---" when the optional module is not implemented.
HD VP FPGA3	6093Vxx.xx.xx		Displays "---" when the optional module is not implemented.
TRX VP FPGA1	6089Vxx.xx.xx		
TRX VP FPGA2	6090Vxx.xx.xx		
TRX VP FPGA3	6093Vxx.xx.xx		
RET PRC FPGA1	6102Vxx.xx.xx		
RET PRC FPGA2	6103Vxx.xx.xx		
PLS/AUX FPGA	6115Vxx.xx.xx		
MPU FPGA	6117Vxx.xx.xx		
12G OUT FAGA	6128Vxx.xx.xx		Displays "---" when the optional module is not implemented.
USB DATA SAVE			Collects the log data.
LOG DATA	DIAG	DIAG, SWCNTL, MENU, ALL	
PUSH SET --> SAVE			
OTHERS			
PM TALLY SEL	Y	Y / COMM	Selects Y TALLY OUT or COMM TALLY OUT.
REM OPT ALARM LEVEL	ATTEN	ATTEN / WARNING / NG	Sets the optical receiver level of the optical alarm on the remote panel.
REAR FAN SPEED	FAST	FAST/MIDDLE/LOW	Sets the rotating speed of the fan motor on the back side of CCU.

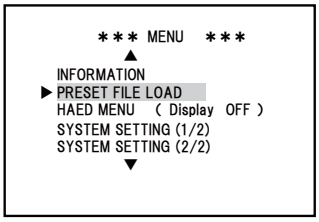
6.3 Setting of CCU Menu

Explains the CCU menu item operating of OCP-MCP-300 and CCU front side.

■ *Setting of PRESET FILE*

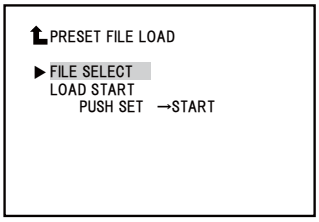
Loads the data of PRESET file from the internal memory.

Main menu screen



Move to the flashing cursor to "PRESET FILE LOAD" and confirm.

Sub menu screen



The submenu "PRESET FILE LOAD" is displayed.

PRESET FILE Setting Menu

Menu	Initial setting	Setting value	Description, Remarks
PRESET FILE LOAD			Preset file load
FILE SELECT	ENGINEER-1	ENGINEER-1	Selects the ENGINEER-1 file
		ENGINEER-2	Selects the ENGINEER-2 file
		ENGINEER-3	Selects the ENGINEER-3 file
		FACTORY	Selects the FACTORY file
FILE SELECT	READY	READY	Data transfer (LOAD) before execution.
		START	Data transfer (LOAD) start.
		CANSEL	Data transfer (LOAD) cancellation.
PUSH SET ---> START			
CAMERA MENU			Displays "Camera Power OFF" when the power of camera is turned off.

1 Set the blinking cursor to FILE SELECT and select a target file to transfer (LOAD) the data.

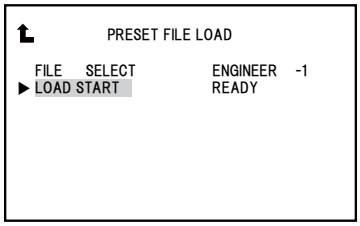
When the blinking cursor is moved to "LOAD START" and finalized, the mode set value changes from "READY" to "START".

2 - When "CANCEL" is selected, the setting is canceled, and the status returns to "READY" status.
- When "START" is selected, "PUSH SET —> START" is displayed at the lower section of the screen. When "START" is selected, proceed to Step 3.

3 While "PUSH SET —> START" is selected, finalize the operation. The data transfer (LOAD) starts.

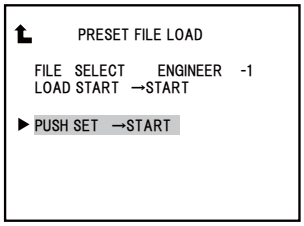
When loading of the file completes, the message "FAIL-SAFE DATA LOAD COMPLETED" appears on the screen. Then, CCU re-start automatically, and the operation completes.

Sub menu screen



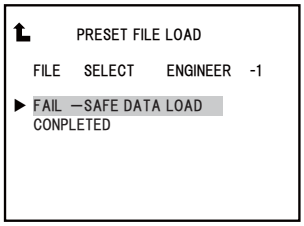
Move to the flashing cursor to "LOAD START" and confirm.

Sub menu screen



When "START" is selected, the message is displayed in the bottom of the screen.

Item setting screen

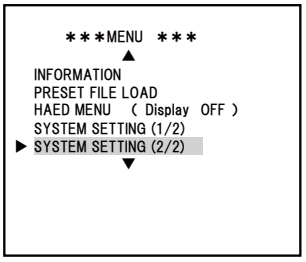


"FAIL-SAFE DATA LOAD COMPLETED" is displayed in the middle of the screen, and then restart.

■ *INTERCOM SETTING*

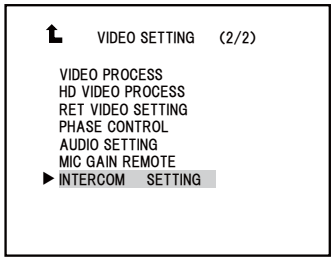
Sets INTERCOM.

Main menu screen



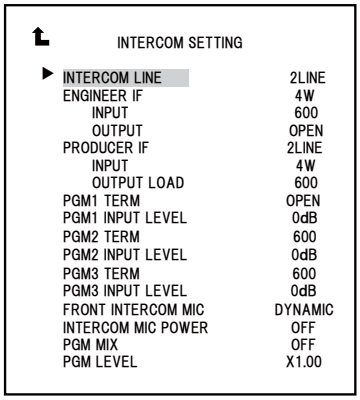
Move to the flashing cursor to "SYSTEM SETTING (2/2)" and confirm.

Sub menu screen



Move to the flashing cursor to "INTERCOM SETTING" and confirm.

Item setting screen



The submenu "INTERCOM SETTING" is displayed, on which you can perform various settings.

Note:

- Setting of ENGINEER /PRODUCER IF and Items that can be linked

ENG/PROD IF	4W	RTS	Cler-Com
INPUT TERM	600 / 10k	---	---
OUTPUT LOAD	---	OPEN / 200	OPEN / 200

Generally, OUTPUT LOAD is set to "OPEN". When CCU is detached from the external system, set to "200".

- Setting of FRONT INTERCOM and Items that can be linked

FRONT INTERCOM	DYNAMIC	CARBON	ECM
MIC POWER SUPPLY	Fixed to OFF	Fixed to ON	ON / OFF
Input level (Hidden)	-60dBu	-10dBu	-40dBu

Set according to the microphone type of the headset to be used.

INTERCOM Setting Menu

Menu	Initial setting	Setting value	Description, Remarks
INTERCOM SETTING			
INTERCOM LINE	2LINE	2LINE	This is the setting when the line system is used as individual two lines of Engineer/Producer.
		1LINE	Integrate Producer line to Engineer line to make them to one line.
ENGINEER IF	4W	4W	It sets Engineer line intercom system in 4-wire.
		RTS	It sets Engineer line intercom system in RTS.
		CC	It sets Engineer line intercom system in Cler-Com.
INPUT	600	600	It sets Input termination impedance of the Engineer line intercom system in 600Ω.
		10k	It sets Input termination impedance of the Engineer line intercom system in 10kΩ.
OUTPUT	---	OPEN	It sets system impedance setting of the Engineer line RTS/Cler-Com in OPEN.
		200	It sets system impedance setting of the Engineer line RTS/Cler-Com in 200Ω.
PRODUCER IF	4W	4W	It sets Producer line intercom system in 4-wire.
		RTS	It sets Producer line intercom system in RTS.
		CC	It sets Producer line intercom system in Cler-Com.
INPUT	600	600	It sets Input termination impedance of the Producer line intercom system in 600Ω.
		10k	It sets Input termination impedance of the Producer line intercom system in 10kΩ.
OUTPUT	---	OPEN	It sets system impedance setting of the Producer line RTS/Cler-Com in OPEN.
		200	It sets system impedance setting of the Producer line RTS/Cler-Com in 200Ω.
PGM1 TERM	600	600	It sets line termination impedance of the Program Audio #1 in 600Ω.
		10k	It sets line termination impedance of the Program Audio #1 in 10kΩ.
PGM1 INPUT LEVEL	0dB	4dB	It sets input level of the Program Audio #1 in +4dBs.
		0dB	It sets input level of the Program Audio #1 in 0dBs.
		-20dB	It sets input level of the Program Audio #1 in -20dBs.
PGM2 TERM	600	600	It sets line termination impedance of the Program Audio #2 in 600Ω.
		10k	It sets line termination impedance of the Program Audio #2 in 10kΩ.
PGM2 INPUT LEVEL	0dB	4dB	It sets input level of the Program Audio #2 in +4dBs.
		0dB	It sets input level of the Program Audio #2 in 0dBs.
		-20dB	It sets input level of the Program Audio #2 in -20dBs.
PGM3 TERM	600	600	It sets line termination impedance of the Program Audio #3 in 600Ω.
		10k	It sets line termination impedance of the Program Audio #3 in 10kΩ.
PGM3 INPUT LEVEL	0dB	4dB	It sets input level of the Program Audio #3 in +4dBs.
		0dB	It sets input level of the Program Audio #3 in 0dBs.
		-20dB	It sets input level of the Program Audio #3 in -20dBs.
FRONT INTERCOM MIC	DYNAMIC	DYNAMIC	It sets headset microphone to be connected to the CCU front side of the instrument in DYNAMIC type.
		CARBON	It sets headset microphone to be connected to the CCU front side of the instrument in CARBON type.
		ECM	It sets headset microphone to be connected to the CCU front side of the instrument in ECM type.
INTERCOM MIC POWER	OFF	ON/OFF	It sets whether or not the power is supplied when the microphone is set to EMC.
PGM MIX	OFF	OFF/PGM1/ PGM2/PGM3	It sets whether or not the PGM is mixed to the INTERCOM output at the CCU front side.
PGM LEVEL	X1.00	X0.00 to 2.00	It sets level of PGM to mix in INTERCOM output at the CCU front side.

7

Helpful Technical Information

7.1 4K Format

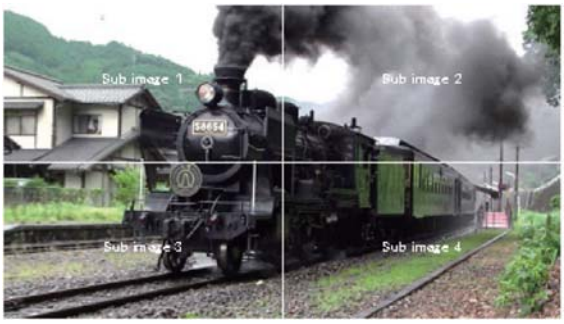
This section explains the process and format used to transmit 4K video signals.

4K Format and HD Format

Term:

- 4K
  4K indicates the video outputs with active image area of 3840 x 2160 or 4096 x 2160. In this document, 4K indicates the 3840 x 2160 output.
- HD (SDI)
  Signals that comply with SMPTE 292 1.5Gb/s Signal/Data Serial Interface 1280×720, 1920 x 1080.
- 3G (SDI)
  Signals that comply with SMPTE 424/425 3Gb/s Signal/Data Serial Interface 1920×1080 (Level-A/B).
- Quad Link
  A method to construct a 4K image with 4 links.

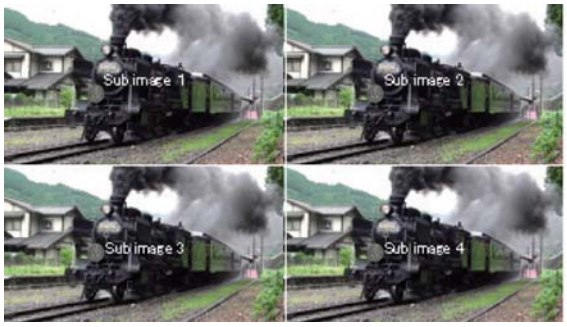
■ *4K Video Output/Area Split Output (SQD)*



4K SDI Output (SQUARE DIVISION)

- This method horizontally or vertically splits the 3840×2160 image size output into two images, then transmits and displays four 1920×1080 sub images (Sub Image 1 to 4).

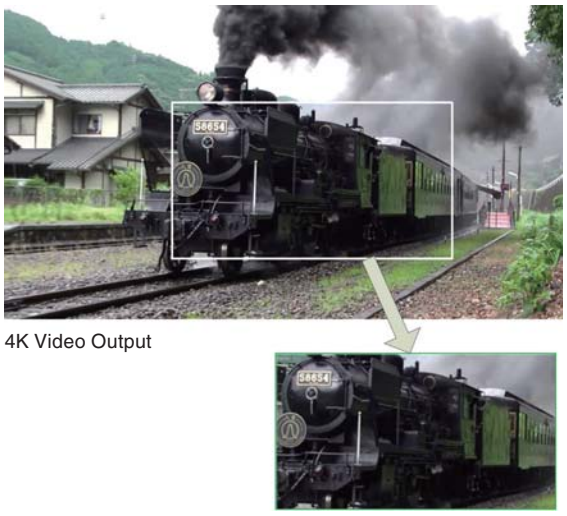
■ *4K Video Output/Pixel Split Output (2SI)*



4K SDI Output (2 SAMPLE INTERLEAVE)

- This method horizontally splits the image size (per 2 pixels and every the other line) into four 1920×1080 sub images (Sub Image 1 to 4) to transmit and display.

■ HD Video Output/Cutout Output



4K Video Output

HD Video Output

- The range equivalent to the 2K video signals is cutout at an arbitrary position from the 4K video signals, and the cutout output is outputted.

■ HD Video Output (D/C: Down Convert Output)

4K Video Output

HD Video Output

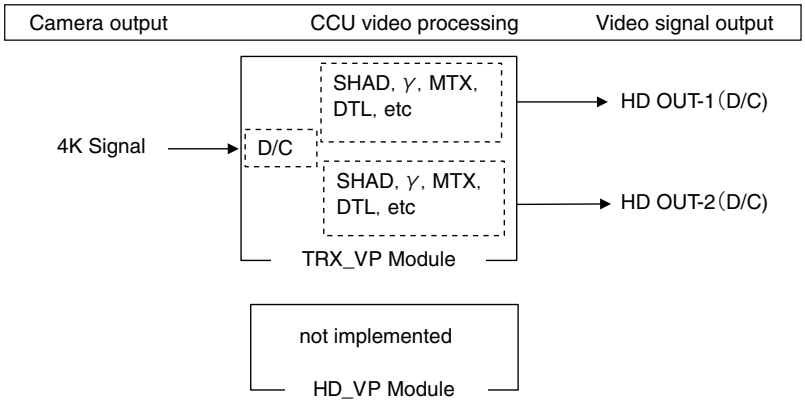
- The 4K video signals are down converted to HD image size and outputted.

■ *Output Form by Mode*

Indicates the video processing system of the CCU implemented.
Depending on the availability of the optional module, the CCU output can be 4K only, HD only, 4K/HD simulcast, or HD double speed/normal speed simulcast.

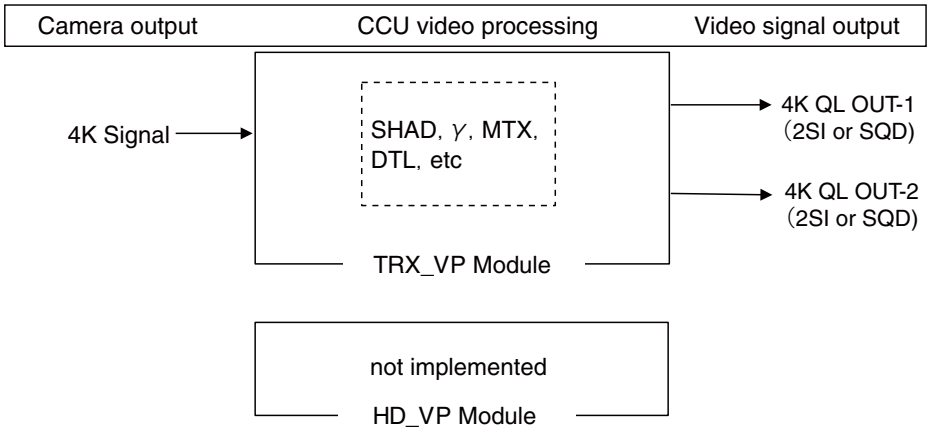
1 Plan A-1 (Standard configuration: HD mode)

- TRX_VP module is the HDTV (D/C) output mode.
- HD_VP module not implemented



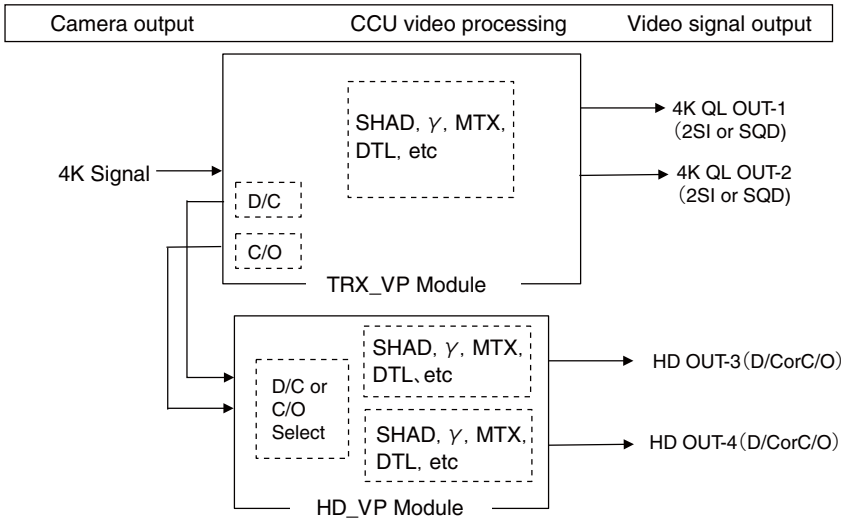
2 Plan A-2 (Standard configuration: 4K mode)

- TRX_VP module is the 4K output mode.
- HD_VP module not implemented



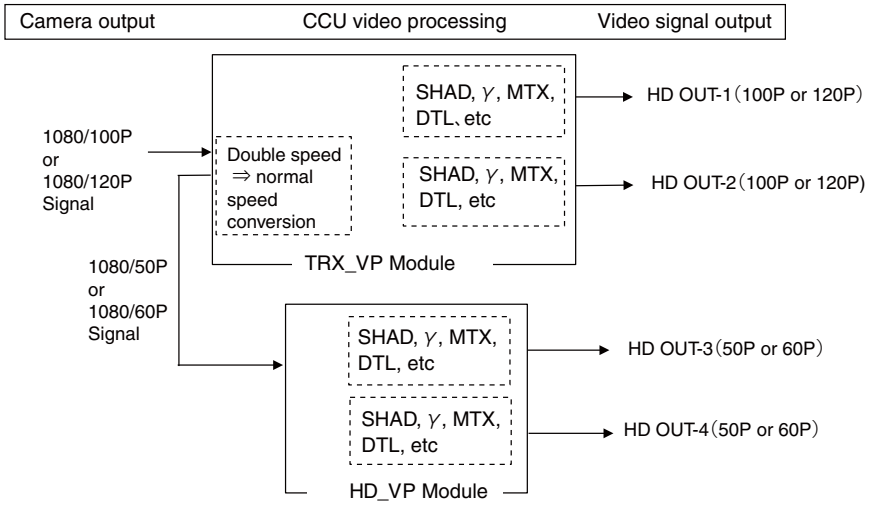
3 Plan B-1 (Optional implementation: Normal speed mode)

- TRX_VP module is the 4K output mode.
- HD_VP module implemented



4 Plan B-2 (Optional implementation: Double speed mode)

- TRX_VP module is HD double speed mode.
- HD_VP module implemented



4K/HD Format

The following shows the list of 4K/HD format, output format, and signal format displayed on the camera/CCU menus and self diagnosis display screen (Diagnostic Information).

Quad Link HD-SDI (Square division)

Format			SDI Signal	
3840x2160	progressive	30/M	2160P29.94	1.485/M Gbps 422
3840x2160	progressive(sF)	30/M	2160PsF29.94	1.485/M Gbps 422
3840x2160	progressive	25	2160P25	1.485 Gbps 422
3840x2160	progressive(sF)	25	2160PsF25	1.485 Gbps 422
3840x2160	progressive	24	2160P24	1.485 Gbps 422
3840x2160	progressive(sF)	24	2160PsF24	1.485 Gbps 422
3840x2160	progressive	24/M	2160P23.98	1.485/M Gbps 422
3840x2160	progressive(sF)	24/M	2160PsF23.98	1.485/M Gbps 422

Quad Link 3G-SDI (2-sample interleave division / Square division)

Format			SDI Signal		Standard
3840x2160	progressive	60/M	2160P59.94-3G	2.970/M Gbps 422	SMPTE 424/425
3840x2160	progressive	50	2160P50-3G	2.970 Gbps 422	SMPTE 424/425
3840x2160	progressive	30/M	2160P29.98-3G	2.970/M Gbps 444	SMPTE 424/425
3840x2160	progressive	25	2160P25-3G	2.970 Gbps 444	SMPTE 424/425
3840x2160	progressive	24	2160P24-3G	2.970 Gbps 444	SMPTE 424/425
3840x2160	progressive	24/M	2160P23.98-3G	2.970/M Gbps 444	SMPTE 424/425

Note:

sF: segmented Frame
/M: Indicates /1.001.

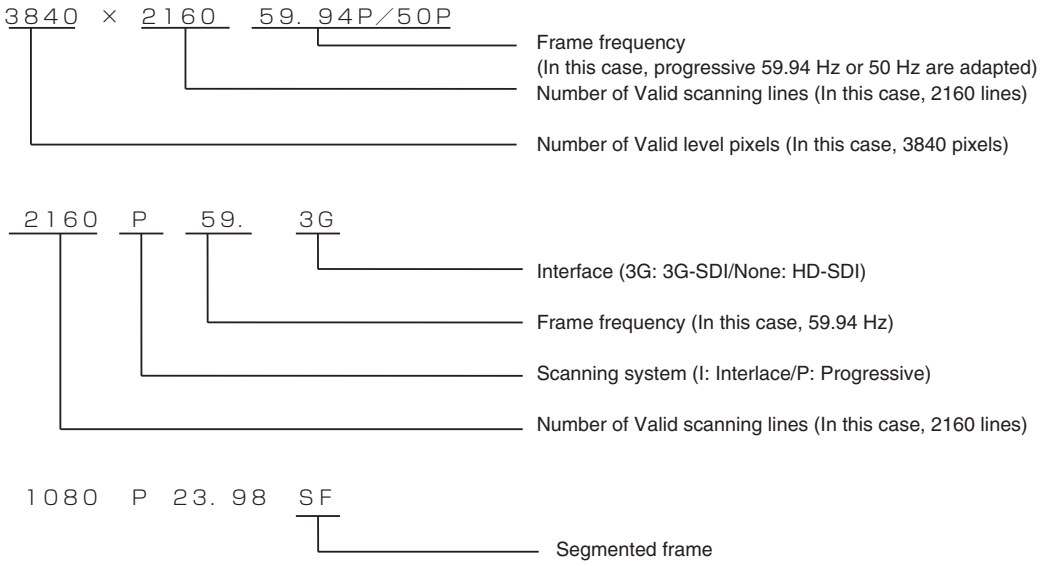
Caution

In SMPTE ST 425-5, Quad Link of 1.5G-SDI is not defined. Only certain devices can support the signal reception of HD-SDI (1.5G) Quad Link.

Reference:

■ *Menu Display*

This section explains 4K format displayed on the menu and self diagnosis display using examples.



HD Format

Format			SDI Signal		Standard
1920x1080	interlace	60/M	1080i59.94	1.485/M Gbps 422	274M/292M
1920x1080	progressive(sF)	24/M	1080PsF23.98	1.485/M Gbps 422	274M/292M
1920x1080	progressive	24/M	1080P23.98	1.485/M Gbps 422	274M/292M
1920x1080	progressive(sF)	30/M	1080PsF29.97	1.485/M Gbps 422	PR211/292M
1920x1080	progressive	30/M	1080P29.97	1.485/M Gbps 422	274M/292M
1280x720	progressive	60/M	720P59.94	1.485/M Gbps 422	296M/292M
1920x1080	interlace	50	1080i50	1.485 Gbps 422	274M/292M
1920x1080	progressive(sF)	25	1080PsF25	1.485 Gbps 422	PR211/292M
1920x1080	progressive	25	1080P25	1.485 Gbps 422	274M/292M
1920x1080	progressive(sF)	24	1080PsF24	1.485 Gbps 422	PR211/292M
1920x1080	progressive	24	1080P24	1.485 Gbps 422	274M/292M
1280x720	progressive	50	720P50	1.485 Gbps 422	296M/292M
1920x1080	progressive	60/M	1080P59.94	2.970/M Gbps 422	274M/425M
1920x1080	interlace	60/M	1080i59.94	2.970/M Gbps 444	274M/425M
1920x1080	progressive(sF)	24/M	1080PsF23.98	2.970/M Gbps 444	PR211/425M
1920x1080	progressive	24/M	1080P23.98	2.970/M Gbps 444	274M/425M
1920x1080	progressive(sF)	30/M	1080PsF29.97	2.970/M Gbps 444	PR211/425M
1920x1080	progressive	30/M	1080P29.97	2.970/M Gbps 444	274M/425M
1920x1080	progressive	50	1080P50	2.970 Gbps 422	274M/425M
1920x1080	interlace	50	1080i50	2.970 Gbps 444	274M/425M
1920x1080	progressive(sF)	25	1080PsF25	2.970 Gbps 444	PR211/425M
1920x1080	progressive	25	1080P25	2.970 Gbps 444	274M/425M
1920x1080	progressive(sF)	24	1080PsF24	2.970 Gbps 444	PR211/425M
1920x1080	progressive	24	1080P24	2.970 Gbps 444	274M/425M

Caution:

*1: 274M, 292M, 274M, and 425M, are SMPTE standards.

Note:

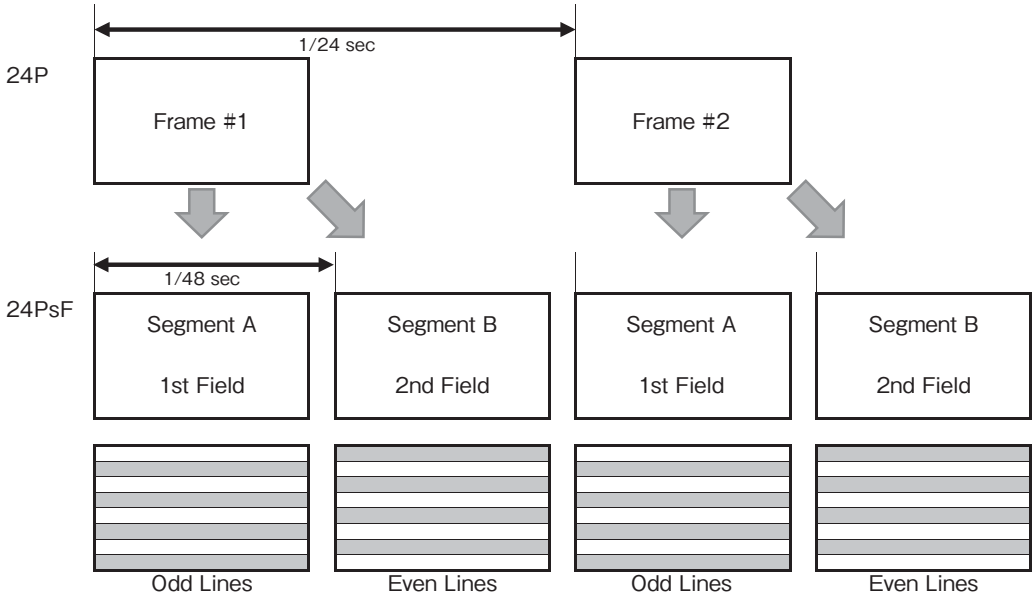
sF: segmented Frame
/M: Indicates /1.001.

7.2 Format Conversion

Frame Field Conversion

■ *"Segmented Frame"*

The segmented frame extracts a video with progressive system per 1 line, and converts into a video with interlace system.



It is characterized by no movement in the first segment (Segment A) and the second segment (Segment B). These two segments are synthesized to one progressive signal.
Since Segmented Frame system can be displayed on the CRT monitor and created without any major change in conventional interlace devices. Therefore, this system has been widely used since the 24P format is introduced.
Since 1080PsF29.97 signals and 1080PsF25 signals can be treated as 1080i59.94 and 1080i50 respectively, in recent years, this system has been often used as the time-release video effect.

7.3 Signal Processing

■ *Hybrid Log-Gamma*

The standardized video signal properties (transfer function) of HDR (High dynamic Range) to reconstruct the wide subject range from dark area to highlight.
UHK-430 camera has the custom gamma table and supports HDR operation by switching.
The transfer function of ARIB STD-B67 and HLG properties are described below.

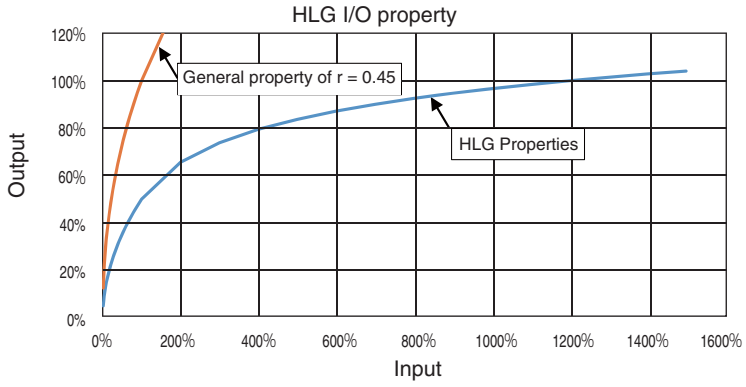
[Transfer Function]

$$E' = \begin{cases} r\sqrt{E} & 0 \leqq E \leqq 1 \\ a \ln(E-b)+c & 1 < E \end{cases}$$

E : Scene brightness (Normalized with standard white level)
E' : Video signal level
r : Video signal level compatible with the standard white level

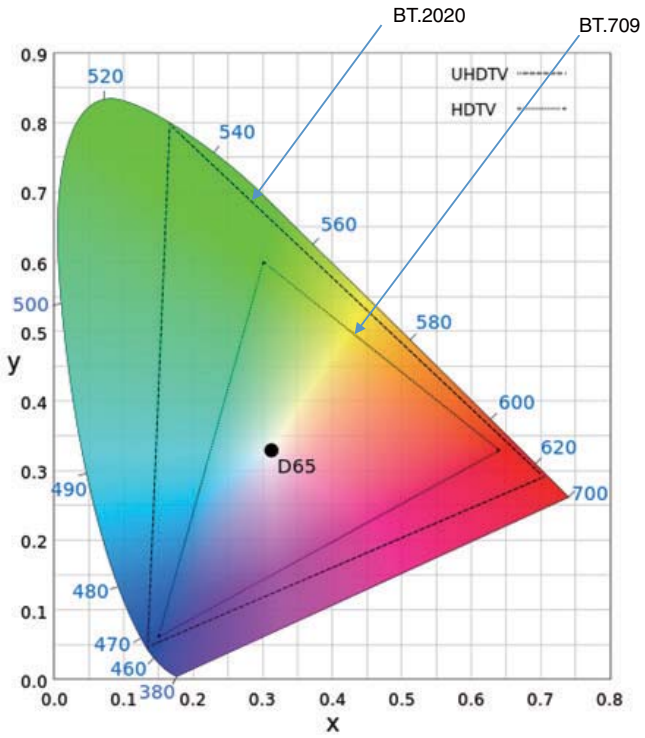
r = 0.5
a=0.17883277, b=0.28466892, c=0.55991073

[HLG Properties]



■ *Colorimetry (Color Region)*

- Rec. ITU-R BT.2020 is adapted for the colorimetry of 4K camera. The color expression region is significantly larger than the HD camera with Rec. ITU-R BT.709.
- The UHK-430 camera has 4K mode and HD mode. Select and set the colorimetry suitable for each mode.
- Shows the chromaticity coordinate of BT.2020 and BT.709.



Caution:

The video format of HDR defines the colorimetry BT.2020 and transfer function HLG system.

7.4 Signal Transmission

■ *Mapping Structure for Level A and Level B of 3G-SDI*

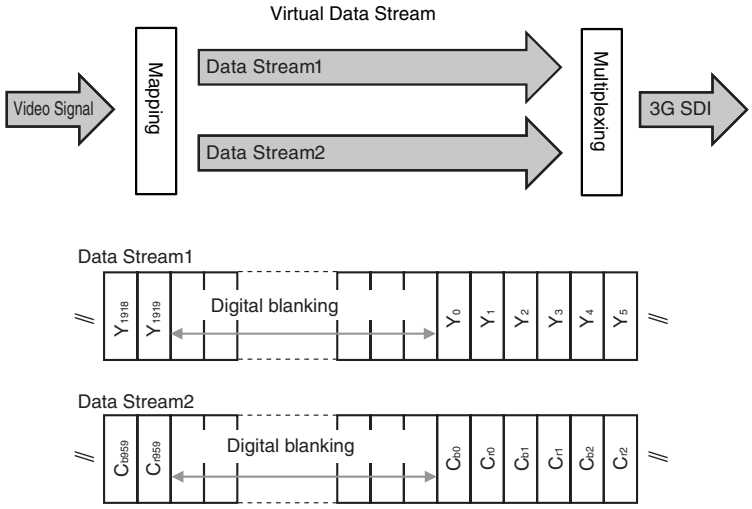
SMPTE424M defines the interface that transmits 3Gbps serial data stream with a coaxial cable.
This stream consists of two virtual data streams (Data Stream 1, Data Stream 2).
Each data stream is mapped based on the mapping structure, and classified into "Level-A" and "Level-B" by the mapping method.

Caution:

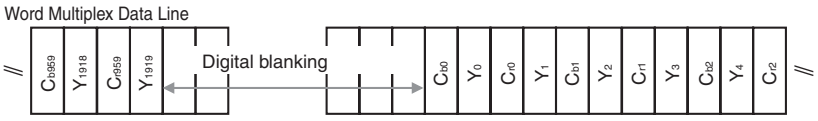
The word data lines of digital blanking is omitted here. Please refer to respective standards for more details.

[Level A]

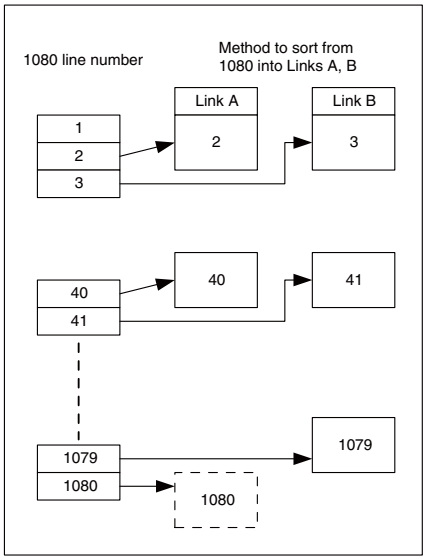
1 For Y/Cb/Cr data, Y data is mapped to Data Stream 1, and Cb/Cr data is mapped to Data Stream 2.



2 Multiplexes the Data Stream 2 and Data Stream 1, in this order, in a word unit, resulting 3Gbps serial data stream.

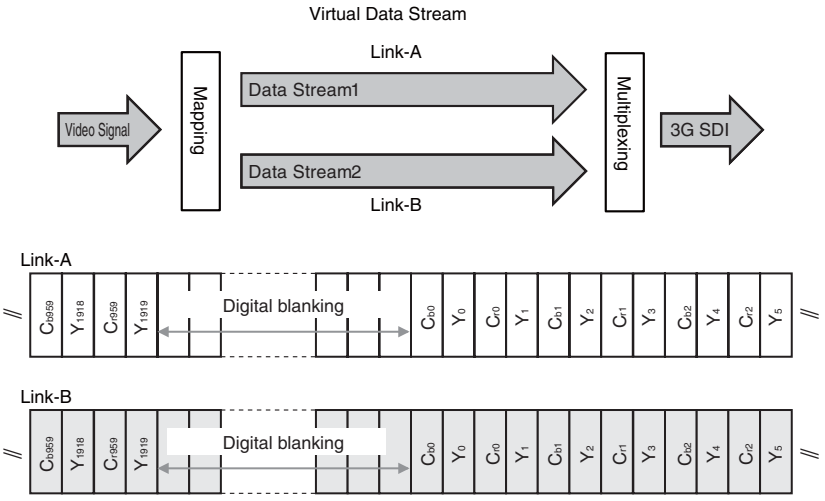


[Level-B]
This method converts the dual link standardized with SMPTE 372M to 3Gbps serial data stream signals.
Sort the 1080/P signals (3G data) into the dual link.

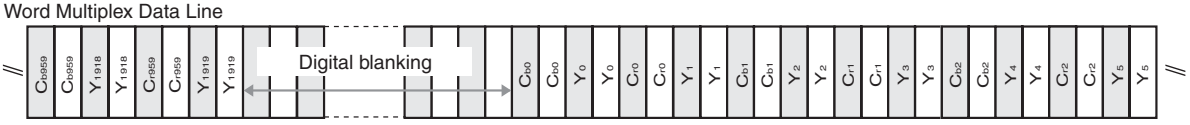


Refer to the BTA S-004C 1.0 version.

1 Map Link A to Data Stream 1, and map Link B to Data Stream 2.



2 Multiplexes the Data Stream 2 and Data Stream 1, in this order, in a word unit, resulting 3Gbps serial data stream.



7.5 Video Signal Format Output

■ *Selecting the Function Combination*

Displays the list of the selected items (monitor format and synchronization signal output) of each function in the format (SDI OUT) of the operation system.
Each setting is performed on the camera head or CCU menu. The list also includes optional items, so some of items may not be selected.

[SDI OUT-1, -2 Selection Combination]

Indicates the video output signal format for the main line system format.

IMAGE SIZE	FREQ & SCAN	SAMPLING	MAPPING	4K OUTPUT	MON OUT	SYNC OUTPUT
3840 x 2160	59.94P	YCbCr 422	3G SDI Level-A/B	3G QL 2SI, or SQD	1080i59.94 422 HD-SDI	1080P59.94/1080i59.94
	50P				1080i50 422 HD-SDI	1080P50/1080i50
	29.97P	RGB 444			1080P29.97 422 HD-SDI, or 1080P29.97sF 422 HD-SDI	1080P29.97/1080i59.94
	25P				1080P25 422 HD-SDI, or 1080P25sF 422 HD-SDI	1080P25/1080i50
	24P				1080P24 422 HD-SDI, or 1080P24sF 422 HD-SDI	1080P24/1080P24sF
	23.98P				1080P23.98 422 HD-SDI, or 1080P23.98sF 422 HD-SDI	1080P23.98/1080P23.98sF
	29.97P	YCbCr 422	HD SDI	HD QL SQD	1080P29.97 422 HD-SDI, or 1080P29.97sF 422 HD-SDI	1080P29.97/1080i59.94
	25P				1080P25 422 HD-SDI, or 1080P25sF 422 HD-SDI	1080P25/1080i50
	24P				1080P24 422 HD-SDI, or 1080P24sF 422 HD-SDI	1080P24/1080P24sF
	23.98P				1080P23.98 422 HD-SDI, or 1080P23.98sF 422 HD-SDI	1080P23.98/1080P23.98sF
	29.97PsF	YCbCr 422	HD SDI	HD QL SQD	1080P29.97sF 422 HD-SDI	1080P29.97/1080i59.94
	25PsF				1080P25sF 422 HD-SDI	1080P25/1080i50
	24PsF				1080P24sF 422 HD-SDI	1080P24/1080P24sF
	23.98PsF				1080P23.98sF 422 HD-SDI	1080P23.98/1080P23.98sF
1920 x 1080	59.94P	YCbCr 422	3G SDI Level-A/B		1080i59.94 422 HD-SDI	1080P59.94//1080i59.94
	50P				1080i50 422 HD-SDI	1080P50/1080i50
	59.94i	YCbCr 422	HD SDI		1080i59.94 422 HD-SDI	1080i59.94
	50i				1080i50 422 HD-SDI	1080i50
	59.94i	RGB 444	3G SDI Level-A/B		1080i59.94 422 HD-SDI	1080i59.94
	50i				1080i50 422 HD-SDI	1080i50
	29.97P	YCbCr 422	HD SDI		1080P29.97 422 HD-SDI, or 1080P29.97sF 422 HD-SDI	1080P29.97/1080i59.94
	25P				1080P25 422 HD-SDI, or 1080P25sF 422 HD-SDI	1080P25/1080i50
	24P				1080P24 422 HD-SDI, or 1080P24sF 422 HD-SDI	1080P24/1080P24sF
	23.98P				1080P23.98 422 HD-SDI, or 1080P23.98sF 422 HD-SDI	1080P23.98/1080P23.98sF
	29.97P	RGB 444	3G SDI Level-A/B		1080P29.97 422 HD-SDI, or 1080P29.97sF 422 HD-SDI	1080P29.97/1080i59.94
	25P				1080P25 422 HD-SDI, or 1080P25sF 422 HD-SDI	1080P25/1080i50
	24P				1080P24 422 HD-SDI, or 1080P24sF 422 HD-SDI	1080P24/1080P24sf
	23.98P				1080P23.98 422 HD-SDI, or 1080P23.98sF 422 HD-SDI	1080P23.98/1080P23.98sF
	29.97PsF	YCbCr 422	HD SDI		1080P29.97sF 422 HD-SDI	1080P29.97/1080i59.94
	25PsF				1080P25sF 422 HD-SDI	1080P25/1080i50
	24PsF				1080P24sF 422 HD-SDI	1080P24/1080P24sF
	23.98PsF				1080P23.98sF 422 HD-SDI	1080P23.98/1080P23.98sF
	29.97PsF	RGB 444	3G SDI Level-A/B		1080P29.97sF 422 HD-SDI	1080P29.97/1080i59.94
	25PsF				1080P25sF 422 HD-SDI	1080P25/1080i50
	24PsF				1080P24sF 422 HD-SDI	1080P24/1080P24sF
	23.98PsF				1080P23.98sF 422 HD-SDI	1080P23.98/1080P23.98sF
	119.88P	YCbCr 422			1080i59.94 422 HD-SDI	1080P59.94/1080i59.94
	100P				1080i50 422 HD-SDI	1080P50/1080i50
1280 x 720	59.94P	YCbCr 422	HD SDI		720P59.94 422 HD-SDI	720P59.94
	50P				720P50 422 HD-SDI	720P50

Caution:

Some items may not be operable due to your operating configuration.

[SDI OUT-3, -4]

Indicates the video output signal format for the optional line system format.

IMAGE SIZE	FREQ & SCAN	SAMPLING	MAPPING	4K OUTPUT	MON OUT	SYNC OUTPUT
1920 x 1080	59.94P	YCbCr 422	3G SDI Level-A/B		1080i59.94 422 HD-SDI	1080P59.94/1080i59.94
	50P				1080i50 422 HD-SDI	1080P50/1080i50
	59.94i	YCbCr 422	HD SDI		1080i59.94 422 HD-SDI	1080i59.94
	50i				1080i50 422 HD-SDI	1080i50
	59.94i	RGB 444	3G SDI Level-A/B		1080i59.94 422 HD-SDI	1080i59.94
	50i				1080i50 422 HD-SDI	1080i50
	29.97P	YCbCr 422	HD SDI		1080P29.97 422 HD-SDI, or 1080P29.97sF 422 HD-SDI	1080P29.97/1080i59.94
	25P				1080P25 422 HD-SDI, or 1080P25sF 422 HD-SDI	1080P25/1080i50
	24P				1080P24 422 HD-SDI, or 1080P24sF 422 HD-SDI	1080P24/1080P24sF
	23.98P				1080P23.98 422 HD-SDI, or 1080P23.98sF 422 HD-SDI	1080P23.98/1080P23.98sF
	29.97P	RGB 444	3G SDI Level-A/B		1080P29.97 422 HD-SDI, or 1080P29.97sF 422 HD-SDI	1080P29.97/1080i59.94
	25P				1080P25 422 HD-SDI, or 1080P25sF 422 HD-SDI	1080P25/1080i50
	24P				1080P24 422 HD-SDI, or 1080P24sF 422 HD-SDI	1080P24/1080P24sF
	23.98P				1080P23.98 422 HD-SDI, or 1080P23.98sF 422 HD-SDI	1080P23.98/1080P23.98sF
	29.97PsF	YCbCr 422	HD SDI		1080P29.97sF 422 HD-SDI	1080P29.97/1080i59.94
	25PsF				1080P25sF 422 HD-SDI	1080P25/1080i50
	24PsF				1080P24sF 422 HD-SDI	1080P24/1080P24sF
	23.98PsF				1080P23.98sF 422 HD-SDI	1080P23.98/1080P23.98sF
	29.97PsF	RGB 444	3G SDI Level-A/B		1080P29.97sF 422 HD-SDI	1080P29.97/1080i59.94
	25PsF				1080P25sF 422 HD-SDI	1080P25/1080i50
	24PsF				1080P24sF 422 HD-SDI	1080P24/1080P24sF
	23.98PsF				1080P23.98sF 422 HD-SDI	1080P23.98/1080P23.98sF
1280 x 720	59.94P	YCbCr 422	HD SDI		720P59.94 422 HD-SDI	720P59.94
	50P				720P50 422 HD-SDI	720P50

Caution:

Some items may not be operable due to your operating configuration.

■ *TRUNK VIDEO format is compatible with CCU output format settings*

CCU OUTPUT FRAME /FIELD RATE			Camera HD TRUNK IN	
59.94	Progressive	Interlace	1080I59.94 YCbCr 4:2:2	HD-SDI
			1080P29.97sF YCbCr 4:2:2	HD-SDI
50	Progressive	Interlace	1080I50 YCbCr 4:2:2	HD-SDI
			1080P25sF YCbCr 4:2:2	HD-SDI
29.97	Progressive	PsF	1080P29.97 YCbCr 4:2:2	HD-SDI
			1080P29.97sF YCbCr 4:2:2	HD-SDI
25	Progressive	PsF	1080P25 YCbCr 4:2:2	HD-SDI
			1080P25sF YCbCr 4:2:2	HD-SDI
24	Progressive	PsF	1080P24 YCbCr 4:2:2	HD-SDI
23.98	Progressive	PsF	1080P23.98 YCbCr 4:2:2	HD-SDI

■ *QTV/RETURN VIDEO format is compatible with CCU output format settings*

CCU OUTPUT FRAME /FIELD RATE			CCU HD QTV IN / RETURN IN	
59.94	Progressive	Interlace	1080P59.94 YCbCr 4:2:2	3G-SDI LVL-A/B
			1080I59.94 RGB 4:4:4	3G-SDI LVL-A/B
			1080I59.94 YCbCr 4:2:2	HD-SDI
50	Progressive	Interlace	1080P50 YCbCr 4:2:2	3G-SDI LVL-A/B
			1080I50 RGB 4:4:4	3G-SDI LVL-A/B
			1080I50 YCbCr 4:2:2	HD-SDI
29.97	Progressive	PsF	1080P29.97 RGB 4:4:4	3G-SDI LVL-A/B
			1080P29.97sF RGB 4:4:4	3G-SDI LVL-A/B
			1080P29.97 YCbCr 4:2:2	HD-SDI
			1080P29.97sF YCbCr 4:2:2	HD-SDI
25	Progressive	PsF	1080P25 RGB 4:4:4	3G-SDI LVL-A/B
			1080P25sF RGB 4:4:4	3G-SDI LVL-A/B
			1080P25 YCbCr 4:2:2	HD-SDI
			1080P25sF YCbCr 4:2:2	HD-SDI
24	Progressive	PsF	1080P24 RGB 4:4:4	3G-SDI LVL-A/B
			1080P24sF RGB 4:4:4	3G-SDI LVL-A/B
			1080P24 YCbCr 4:2:2	HD-SDI
			1080P24sF YCbCr 4:2:2	HD-SDI
23.98	Progressive	PsF	1080P23.98 RGB 4:4:4	3G-SDI LVL-A/B
			11080P23.98sF RGB 4:4:4	3G-SDI LVL-A/B
			1080P23.98 YCbCr 4:2:2	HD-SDI
			1080P23.98sF YCbCr 4:2:2	HD-SDI

* Even if 3G-SDI signals are inputted to CCU, the QTV/RETURN outputs of the camera are converted to HD-SDI signals.

7.6 Monitor System

■ *Monitor System of Video Signals for Video Main Line*

An example of relationship in monitor system (picture monitor and waveform monitor) for the main line output video system format.

Camera Head SCAN MODE	CCU Output Connector	CCU Output Signal	Bit Rate	Number of cable	Main Line Monitoring System	PM MON（for VE）
1. 3840 x 2160	4K/HD OUT（OUT 1, OUT 2）	4K SQUARE	3Gbps	4	4k MON, 3G compatible HD WFM	HD MON
		or 4K 2SI	3Gbps	4		
	HD OUT（OUT 3, OUT 4）	HD D/C 1080P	3Gbps	1	*3G compatible HD MON, *3G compatible HD WFM	
		HD D/C 1080i	1.5Gbps	1		
		HD C/O 1080P	3Gbps	1		
		HD C/O 1080i	1.5Gbps	1		
					* Operated with 1080P. HD compatible is good when operated with 1080i.	
	PM MONI	1080i	1.5Gbps	1		
2. 1920 x 1080	HD OUT（OUT 1, OUT 2）	HD 1080i/P (59.94/50/29.97/ 25/24/23.98)	3Gbps	1	*3G compatible HD MON, *3G compatible HD WFM	HD MON
		HD 1080i (59.94/50)	1.5Gbps	1		
		HD 1080P/PsF (29.97/25/24/ 23.98)	1.5Gbps	1		
	PM MONI	HD 1080i (59.94/50/29.97/ 25/24/23.98)	1.5Gbps	1		

7.7 Adjusting the Lens

■ *Adjusting the Lens Flange Back*

To operate the zoom lens, the focuses of both "TEL" side (telescope) and "WIDE" (wide angle) have to be adjusted.
If the lens is replaced with another one and zoomed, the focus may not be adjusted. This occurs when the flange back of the lens (distance from the lens mount side to the imaging surface of imaging element) is not in the appropriate position. If the zoom lens is once focused when the distance to the subject is constant, it can stay focused regardless of the zoom operation. Move the flange back position to adjust and stay focused. Once adjusted, it is not necessary to readjust the lens until the lens is replaced with another one.

An example of adjustment method is shown below.

1 Set the IRIS mode switch of zoom lens to “M” (manual).

2 Open the IRIS (F1.4).

It becomes harder to identify the change in video against the rotation of focus ring because the status degree of the IRIS diaphragm (F value is greater) and the depth of the subject get greater.

Note

- Look at the viewfinder screen and shoot the subject in which the video level does not get saturated (filled with white). The subject with detailed patterns is easier to adjust the focus.
- If the subject is too bright and saturated even in the released status, employ the ND filter and darken the lighting, etc.
- Siemens star chart is recommended for the subject. The center part has detailed patterns, so it is easy to adjust the focus. (Refer to the next page.)

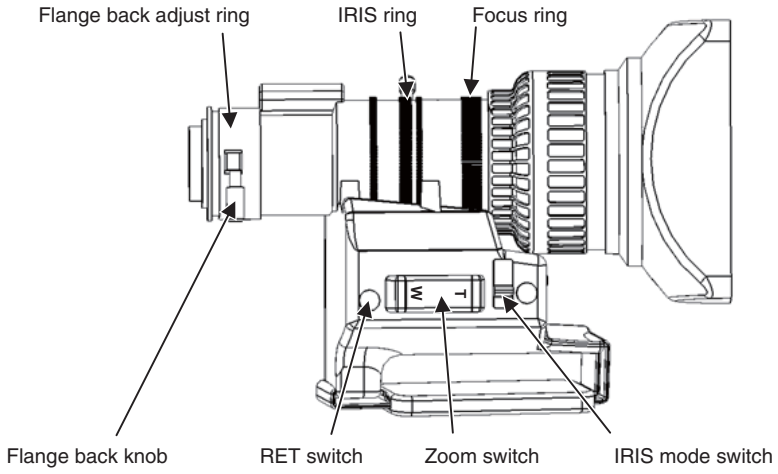
3 Shoot the subject about 5 m away.

4 Press the zoom switch "T", and fully enlarge the lens to the TELE (telescope) side to adjust the focus ring in focus.

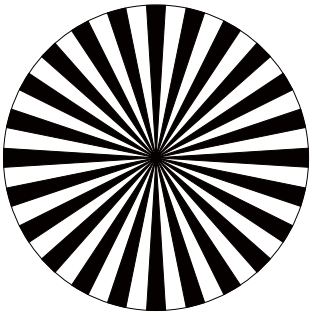
5 Press the zoom switch "M", and fully reduce the lens to the WIDE (wide angle) side. (At this time, be sure not to move the focus ring.)

6 Loosen the flange back knob, and turn it to adjust the focus.

7 Repeat the procedures 4 - 6, and tighten the flange back knob with “T” and “M” both in focus.



An example of the flange back adjustment chart



Siemens star chart

7.8 TRACKER function

■ Overview

TRACKER is a connector used to join the crane BOX, etc. or external system.

■ Functions

(1) DATA TRUNK line (operated exclusively from CRANE line)
(2) CRANE line (operated exclusively from DATA TRUNK line)
(3) TALL signal (R/G)
(4) RET control (1/2ch)
(5) INTERCOM (talk: 1ch / listen: 4ch)

■ Connectors

Receptacle side: HIROSE Electric HR10A-13R-20SB(73)
Plug side: HIROSE Electric HR10A-13P-20PC(73) or equivalent

■ Pin assignment

Pin No.	Name	Function	I/O	External interface
(1)	PC_TXD_P	CRANE / TRNUK DATA OUT	OUT	RS422 (P) *1
(2)	PC_TXD_N	CRANE / TRNUK DATA OUT	OUT	RS422 (N) *1
(3)	PC_RXD_P	CRANE / TRNUK DATA IN	IN	RS422 (P) *1
(4)	PC_RXD_N	CRANE / TRNUK DATA IN	IN	RS422 (N) *1
(5)	GND	Ground for DC+12V power supply / common GND		GND for MU_REAR+12V
(6)	MU_REAR+12V	DC+12V power supply (Max.: 1.5A)		DC+12V(+11V to +18V)
(7)	R_TALLY	R TALLY output	OUT	Open Drain
(8)	G_TALLY	G TALLY output	OUT	
(9)	RET-1	RET-1 SW IN	IN	
(10)	RET-2	RET-2 SW IN	IN	
(11)	INC_MIC_ON	PTT signal of TRACKER MIC (Lo: ON, Hi-Z: OFF)	IN	
(12)	TRACKER_EN	Connector mode selection (L: CRANE mode, Hi-z: TRUNK DATA mode)	IN	—
(13)	RESERVE-1	Reserve	IN	Open Drain
(14)	RESERVE-2	Reserve	IN	
(15)	TRACKER-1	INTERCOM-1 (Receive Audio)	IN	Unbalance Audio 0dBu / -20dBu
(16)	TRACKER-2	INTERCOM-2 (Receive Audio)	IN	
(17)	TRACKER-3	INTERCOM-3 (Receive Audio)	IN	
(18)	TRACKER-4	INTERCOM-4 (Receive Audio)	IN	
(19)	T_TALK_H	INTERCOM-MIC (H) (Talk Audio)	IN	High impedance balanced 0dBu / -20dBu
(20)	T_TALK_C	INTERCOM-MIC (C) (Talk Audio)	IN	

Caution:

*1: DATA TRUNK and CRANE lines uses Pins 1 to 4 exclusively.

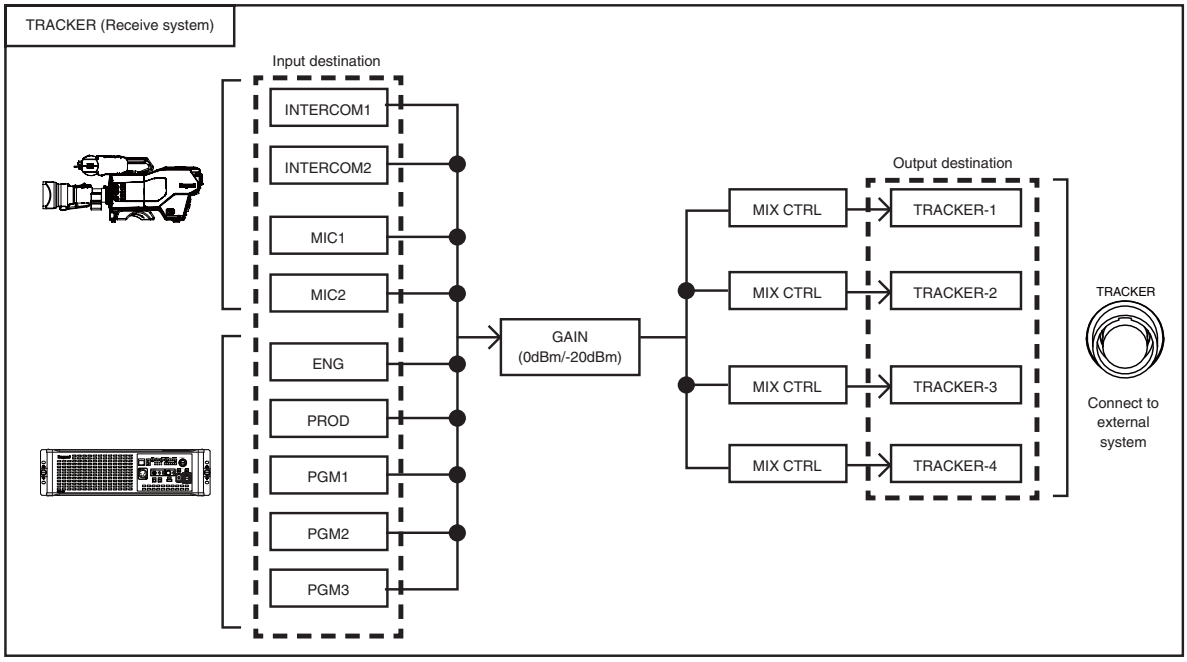
■ Power output

DC+12V 1.5A can be supplied for power supply.
Be sure not to exceed the supply capacity.

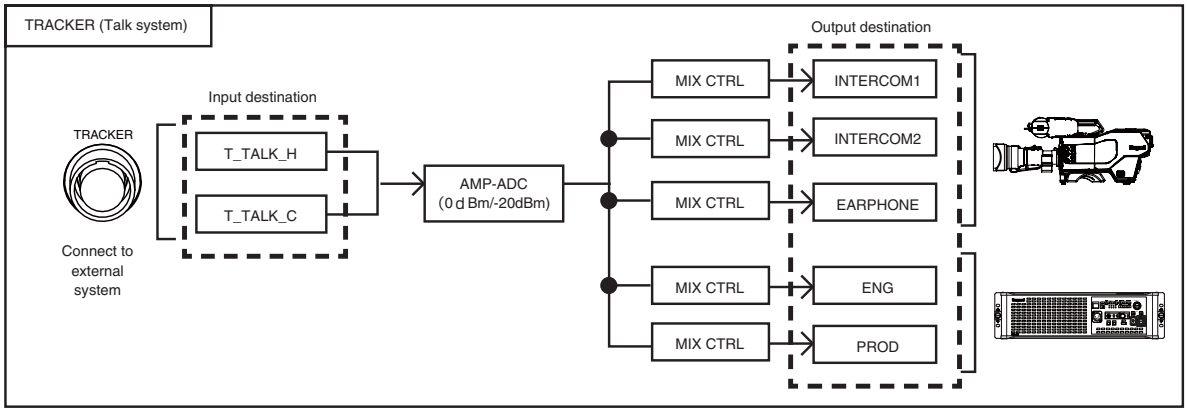
■ *INTERCOM*

In order to establish the INTERCOM for extension, the INTERCOM line has "talk 1ch" and "Receive 4ch" lines.

●The overview of TRACKER Receive lines are shown in the figure below.
Since each channel has a mix control circuit, the input source can be set from the CAMERA menu.
The output gain can be selected from two types, -20dBu or 0dBu.



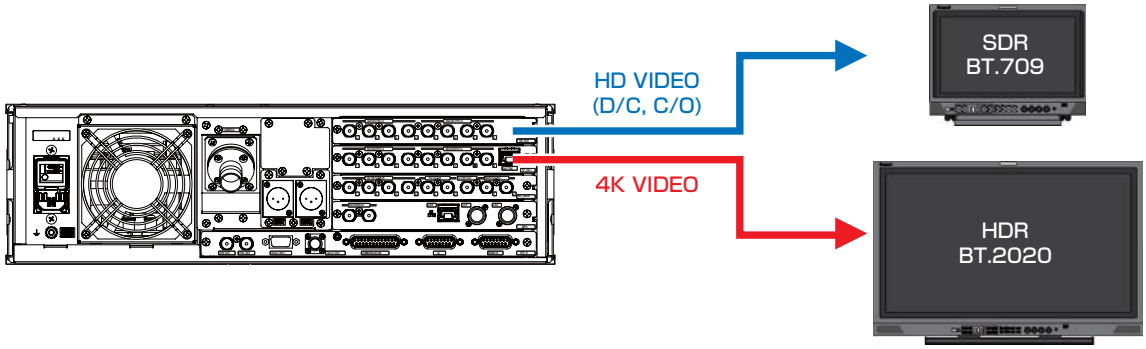
●The overview of TRACKER talk lines are shown in the figure.
TRACKER TALK can set the following functions from the camera menu: Allowing oral communication only between the INCOM of camera head, and including the ENG/PROD on the CCU side to include it in the system side.
The input gain can be selected from two types, -20dBu or 0dBu.



7.9 Simultaneous option

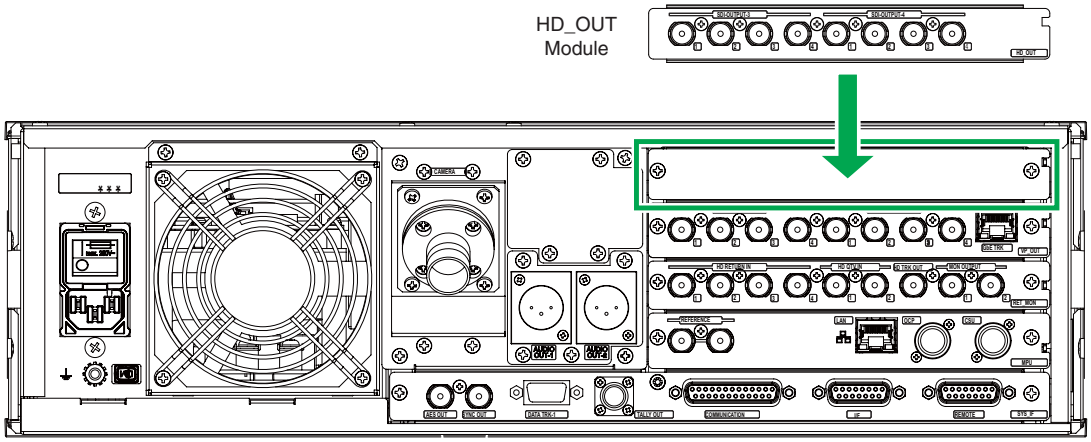
Overview and implementation requirements

By introducing the "HD SIMUL" option to the CCU-430, simultaneous output of HD video and 4K video becomes possible. The HD output can be a simultaneous output of a 1980 x 1080 pixel image down-converted from the 4K image,or an HD cut-out output of a desired section from the 4K image.
The HD system and the 4K system can process images independently. They can individually set the GAMMA curve, color tone adjustment, and contour correction function respectively.

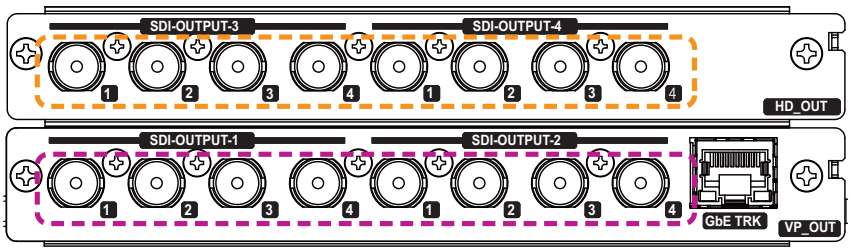


Example of system configuration

Install the front module [HD_VP] and the rear module [HD_OUT] in the CCU-430 for the implementation of the “HD SIMUL” option.



The following shows the CCU video output assignment when the “HD SIMUL” option is implemented.



OUT-1, OUT-2 system 4K main line output

- 4K QUAD LINK 2 system 8 output

SQD or 2SI

The system can not be individually set.

OUT-3, OUT-4 system HD main line output

- SMPTE 424/425 Level-A/B
- SMPTE 292M

2 system 8 output

The system can be individually set.

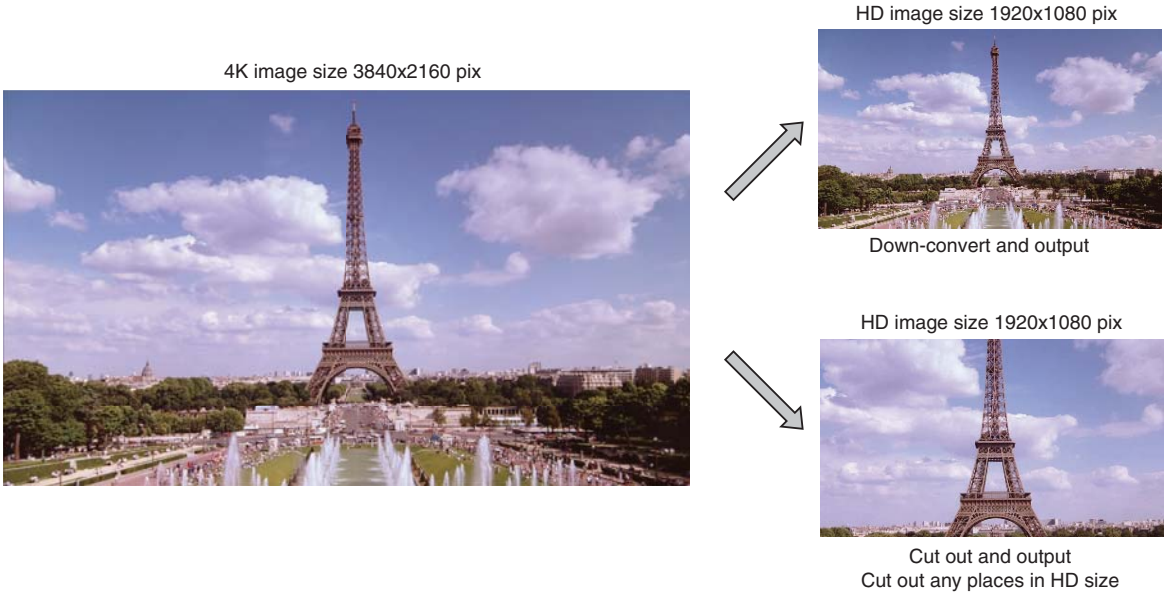
If the “HD SIMUL” option is implemented, SDI OUTPUT-1 and SDI OUTPUT-2 are dedicated for 4K video output. Also, the system cannot be individually set. The 4K format of OUT1 and the 4k format of OUT2 are the same.

The system can be individually set for SDI OUTPUT-3 and SDI OUTPUT-4. The down-convert output and cutout output can be individually assigned. The video output formats can be individually set if they have the same frame rate.

Example

OUT-3	1080P59.94 YCbCr 4:2:2 3G-SDI Level-B	OUT-4	1080I59.94 YCbCr 4:2:2 HD-SDI
OUT-3	1080P29.97 RGB 4:4:4 3G-SDI Level-A	OUT-4	1080P29.97sF YCbCr 4:2:2 HD-SDI
OUT-3	1080P59.94 YCbCr 4:2:2 3G-SDI Level-A	OUT-4	1080P59.94 YCbCr 4:2:2 3G-SDI Level-B

■ *The comparison of down-convert output and cutout output*



* "Standard image (Eiffel Tower) for transparent/high definition" supervised by ITE (The Institute of Image Information and Television Engineers) is used as a sample image.

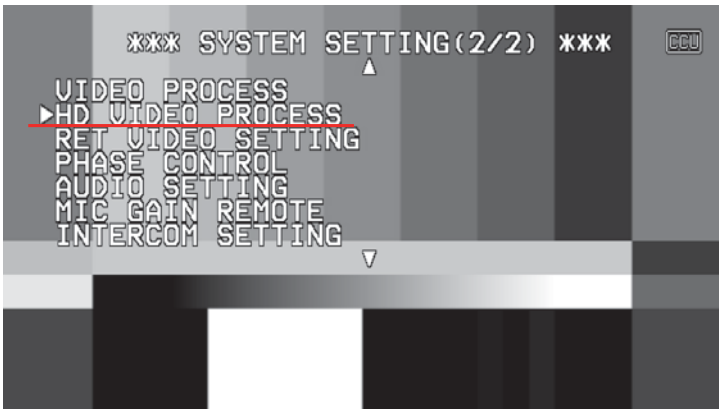
■ *Corresponding remote controller*

Remote controllers corresponding to this product are the OCP-300 operation control panel and the MCP-300 master control panel. In order to activate the "HD SIMUL" optional function, installing a installing "License key" to the control panel is necessary.

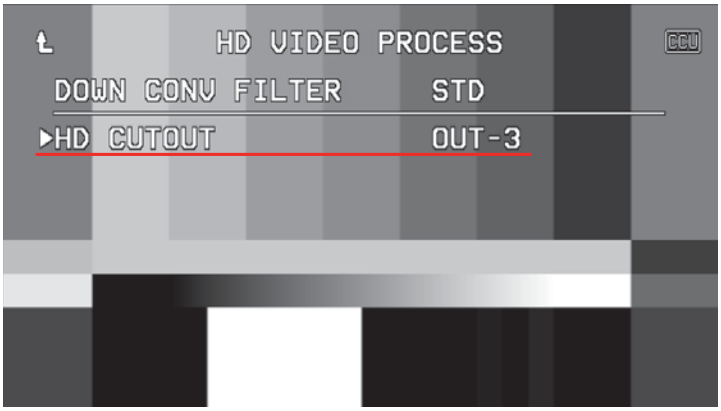
The setting of the down-convert output and cutout output

As a default setting, a down-convert output is assigned for both SDI OUTPUT-3 and SDI OUTPUT-4. When assigning the cut-out to an output, if is set from the CCU MENU.
For the operations and configuration of the CCU MENU, refer to the operation manual chapter 6, "CCU setting and adjustment."

CCU MENU → SYSTEM SETTING (2/2) → HD VIDEO PROCESS



Select the HD CUTOUT.



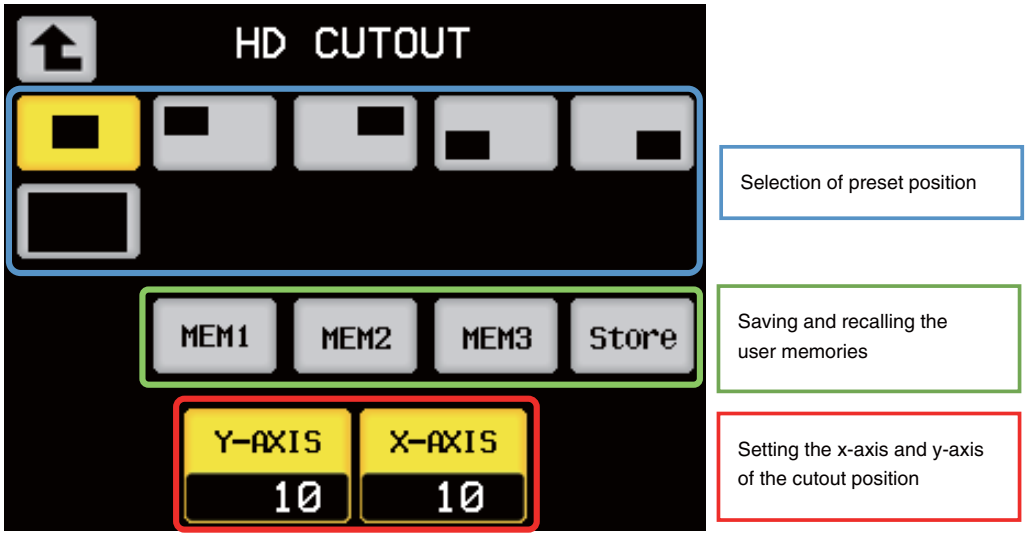
Setting values

OFF	OUT-3/4 are both down-convert outputs
OUT-3	OUT-3: HD CUTOUT output, OUT-4: Down-convert output
OUT-4	OUT-3: Down-convert output, OUT-4: HD CUTOUT output
OUT-3/4	OUT-3/4 are both HD CUTOUT outputs

■ *Operation from the operation control panel (OCP-300)*

The position of the cutout video is set from the OCP-300.

Press the [SETUP] button of OCP-300 and select Setup (2/2) on the LCD → HD CUTOUT.



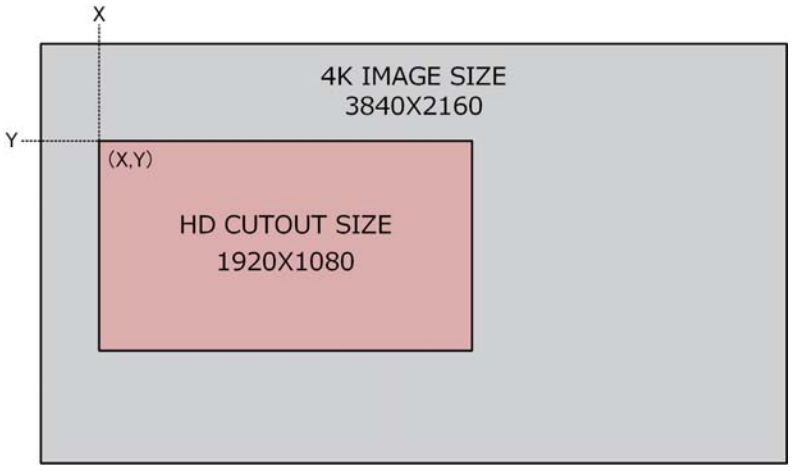
- Corresponding remote controller

Select a preset cutout position. The switch for the currently selected cutout position turns yellow. Five cut-out positions (center, upper left, upper right, lower left, and lower right sections of the screen) and the entire screen (CUTOUT OFF = Down-converting output) can be selected.
After the selection of the preset position, adjusting the position is possible by using X-AXIS and Y-AXIS.

- Saving and recalling the user memories

Up to three cutout positions that were set by the user can be memorized.
After setting the position by using X-AXIS and Y-AXIS, press the Store switch (turns the switch color from gray to yellow. Pressing either MEM1, MEM2, or MEM3 turns the switch color to yellow) Then the setup is memorized.
When recalling a memory, press either MEM1, MEM2, or MEM3.
After recalling a user memory, adjusting the cutout position is possible using X-AXIS and Y-AXIS.
When updating the data of a setup already memorized, overwriting is conducted.

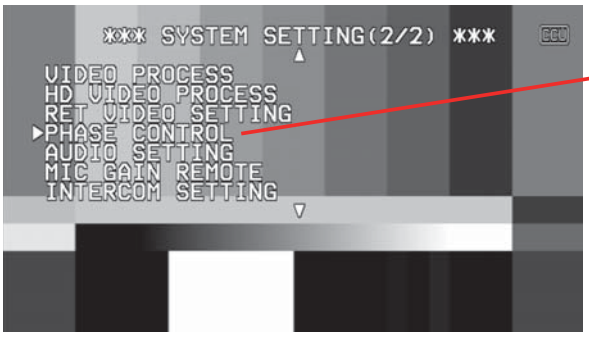
The values of X-AXIS and Y-AXIS indicate the starting point (left top) of the cutout video.



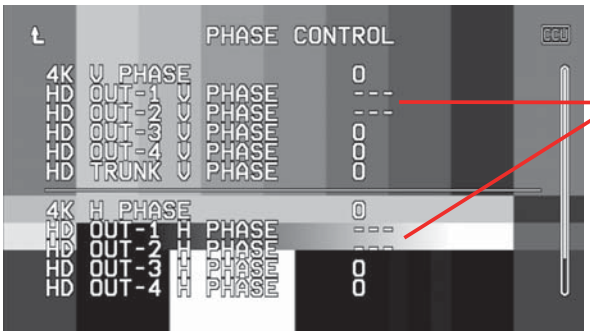
X-AXIS setting range 0 to 1920
Y-AXIS setting range 0 to 1080

Video phase adjustment

This section explains the video phase adjustment during simultaneous operation.
Input an external reference synchronization signal to the CCU. Adjust the video phase using a waveform monitor.



Open CCU MENU to select
"SYSTEM SETTING(2/2)" →
"PHASE CONTROL".



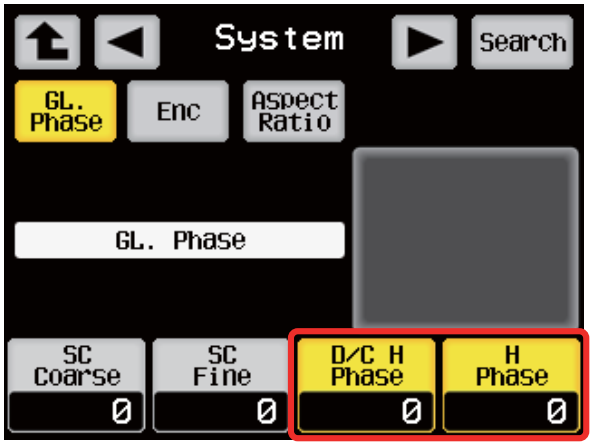
The following items cannot be selected during simultaneous operation.
HD OUT-1 V PHASE
HD OUT-2 V PHASE
HD OUT-1 H PHASE
HD OUT-2 H PHASE

4K V PHASE
Set the vertical phase of 4K video output from SDI OUTPUT-1/2.
HD OUT-3 V PHASE
Set the vertical phase of HD video output from SDI OUTPUT-3.
HD OUT-4 V PHASE
Set the vertical phase of HD video output from SDI OUTPUT-4.

4K H PHASE
Set the horizontal phase of 4K video output from SDI OUTPUT-1/2.
HD OUT-3 H PHASE
Set the horizontal phase of HD video output from SDI OUTPUT-3.
HD OUT-4 H PHASE
Set the horizontal phase of HD video output from SDI OUTPUT-4.

■ *H PHASE control from the OCP-300*

To adjust the horizontal video phase from OCP-300,
press the [SETUP] button to open “System” → “GL. Phase”.

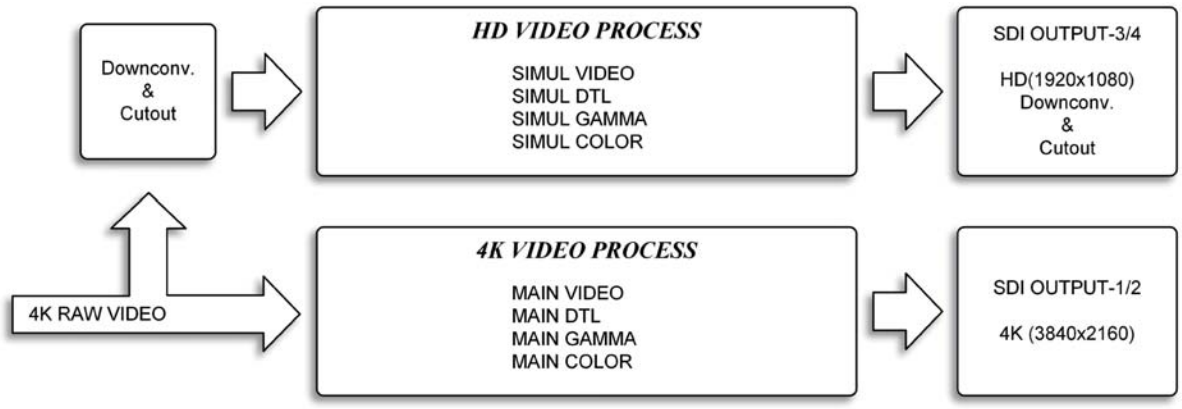


D/C H Phase
: Control the horizontal phase of HD video output from SDI OUTPUT-3/4.

H Phase
: Control the horizontal phase of 4K video output from SDI OUTPUT-1/2.

Image setting for simultaneous operation

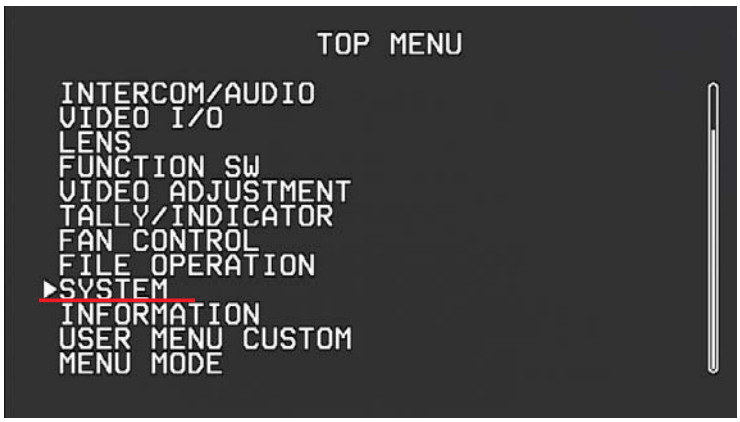
When the "HD SIMUL" option is installed, independent image processing for the HD system and the 4K system becomes possible as shown in the following figure. Due to the two-system parallel processing, the GAMMA curve, color tone adjustment, and contour correction function can be set for the 4K output and the HD output respectively. In addition, interlocking the processes of two system is also possible using common parameters.

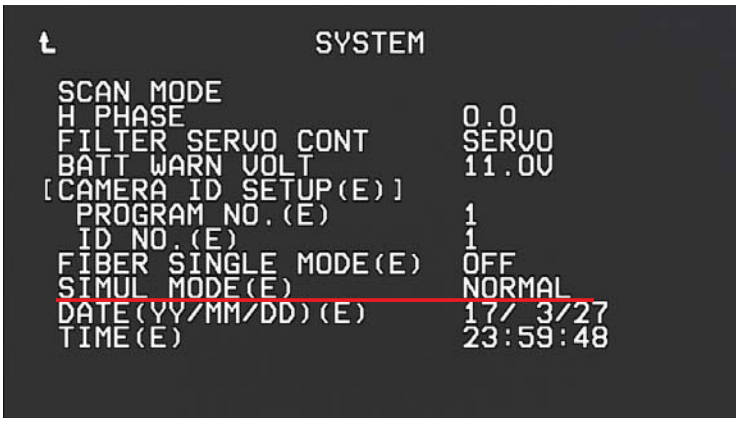


■ *SIMUL mode setting*

The independence of various parameters in simultaneous operation are set in the CAMERA MENU.
Please refer to the operation manual, Chapter 5.2 "Basic operation of the menu screen" for operation and configuration of CAMERA MENU. You can access the CAMERA MENU from the CCU MENU.

CAMERA MENU hierarchy
TOP MENU → MENU MODE → ENGINEER MENU:ON → SYSTEM





SIMUL MODE(E)
Setting values

OFF

OFF: The 4K and HD outputs are controlled by common parameters (multi-links).

NORMAL

In this mode, parameters related to color adjustment function (Color) and outline correction function (Detail) can be individually set for the 4K output and the HD output.
Other controls are multi-link settings.

INDEP GAMMA

In this mode, controls included in the NORMAL mode, plus, GAMMA, KNEE, GAIN, PED, WHITE CLIP, etc. can be individually adjusted for the 4K output and the HD output.

The list of functions that can be individually adjusted in NORMAL and INDEP GAMMA modes.

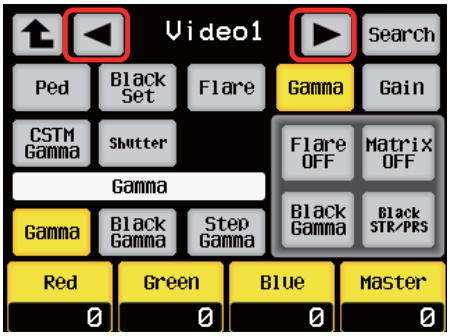
FUNCTION		SIMUL MODE	
		NORMAL	INDEP GAMMA
DTL	GAIN	✓	✓
	FREQ	✓	✓
	B/W	✓	✓
	BAL	✓	✓
	THRESH	✓	✓
	FINE	✓	✓
	NOISE SUP	✓	✓
	Z.TRK	✓	✓
HI-LIGHT DTL	GAIN	✓	✓
	LIMIT	✓	✓
SOFT DTL	WHT SUP	✓	✓
	BLK SUP	✓	✓
SKIN DTL	R HUE/B HUE	✓	✓
	GAIN	✓	✓
	Z.TRK	✓	✓

FUNCTION		SIMUL MODE	
		NORMAL	INDEP GAMMA
COLOR DTL	GAIN	✓	✓
	PHASE	✓	✓
	FINE	✓	✓
	WIDTH1	✓	✓
	WIDTH2	✓	✓
MATRIX CH	1/2/3	✓	✓
MATRIX1	R-G/R-B, G-R/G-B, B-R/B-G	✓	✓
MATRIX2	R-G/R-B, G-R/G-B, B-R/B-G	✓	✓
MATRIX3	R-G/R-B, G-R/G-B, B-R/B-G	✓	✓
COLOR SAT	COLOR SAT	✓	✓
LOWLIGHT SAT	SAT	✓	✓
	THRESH	✓	✓
16 AXES COLOR CORR	HUE	✓	✓
	SAT	✓	✓
	VALUE	✓	✓
COLOR HUE		✓	✓
CUSTOM COLOR EFFECT1	HUE	✓	✓
	SAT	✓	✓
	VALUE	✓	✓
	DTL	✓	✓
	PHASE	✓	✓
	FINE	✓	✓
	WIDTH1	✓	✓
	WIDTH2	✓	✓
CUSTOM COLOR EFFECT2	HUE	✓	✓
	SAT	✓	✓
	VALUE	✓	✓
	DTL	✓	✓
	PHASE	✓	✓
	FINE	✓	✓
	WIDTH1	✓	✓
	WIDTH2	✓	✓
STEP GAMMA	OFF/0.45/0.40/0.35		✓
GAMMA MODE	NORMAL/CUSTOM1/2/3/4/5		✓
GAMMA	MASTER		✓
GAIN	MASTER		✓
PED	MASTER		✓

FUNCTION		SIMUL MODE	
		NORMAL	INDEP GAMMA
SMOOTH KNEE	OFF/TYPE1/2/3		✓
MANUAL KNEE	OFF/ON		✓
TOTAL KNEE(MANUAL)	POINT		✓
	SLOPE		✓
WHITE CLIP	R/G/B		✓

■ *Various settings from the OCP-300*

In case of the OCP-300, a license key of the "HD SIMUL" option is introduced, and the [Video], [Detail], and [Color] pages of Setup are extended, and the [SML Video], [SML Detail], and [SML Color] items are added. On the LCD screen, the [Video], [Detail], and [Color] screens of Setup (1/2) are shifted as follows.



Transition order when the arrow switch is pressed.

Video1 ⇔ Video2 ⇔ SML Video ⇔ Detail ⇔ SML Detail ⇔ Color ⇔ SML Color ⇔

7

Helpful Technical Information

The following shows which operations can be performed on each screen of OCP under certain CAMERA MENU SIMUL MODE setting conditions.

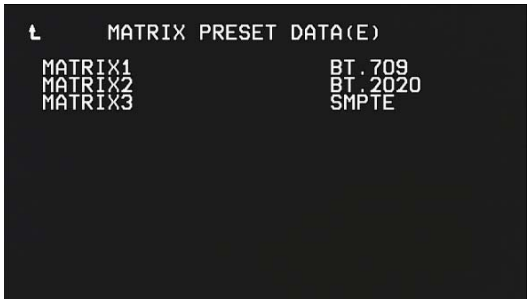
SIMUL MODE	SML Video	SML Detail	SML Color
OFF			
NORMAL		✓	✓
INDEP GAMMA	✓	✓	✓

■ *When SIMUL MODE is turned off*

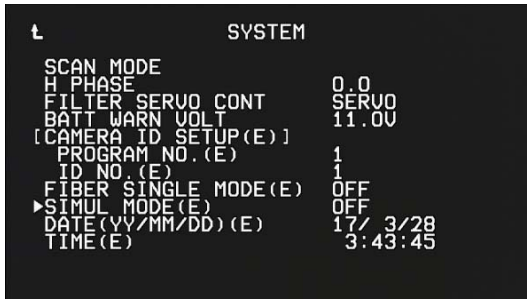
The 4K and HD outputs are processed using common settings.
Video1, Video2, Detail, and Color have common ON/OFF settings and setting values.

[Example]
It is used when both 4K and HD outputs are operated in BT.709 (Gamma, Color space).

Setting the CAMERA MENU



MATRIX1 : BT.709



SIMUL MODE(E) : OFF

OCP-300 [Video1] Gamma → Mode : NOR, Step : 0.45
[Color] Matrix → Matrix Select : 1

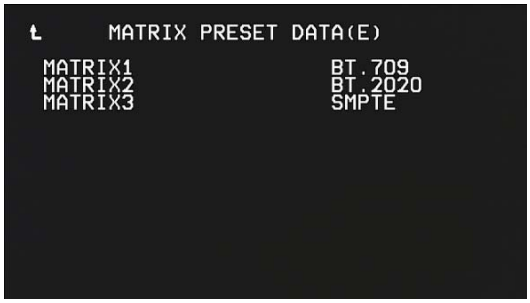
[Operating method]
- On the Video1 screen, changing the Gamma Step setting values controls the 4K output and the HD output simultaneously.
- On the Detail screen, the 4K output and the HD output are simultaneously controlled.
- On the Color screen, the 4K output and the HD output are simultaneously controlled.
- Controlling the SML Video, SML Detail, and SML Color items is not possible.

■ *When SIMUL MODE is NORMAL*

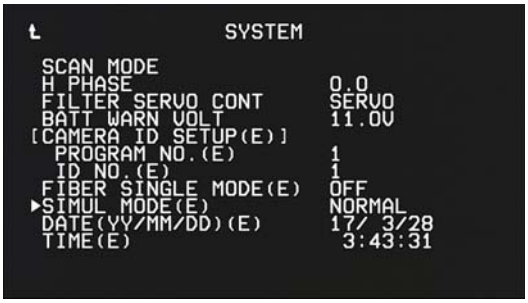
For the control items of Detail and Color, individual setting and control is possible for the 4K output and the HD output.
The ON/OFF setting and the setting values for Video1 and Video2 are common.
Controlling the SML Video item is not possible.
The setup values of the Detail and Color screens apply to the 4K output. The setup values of the SML Detail and SML Color screens are reflected to the HD output side.

[Example]
4K output Gamma : BT.709, Color space : BT.2020
HD output Gamma : BT.709, Color space : BT.709
Reference) The monitor to display the 4K output must support Color space BT.2020.
A monitor without support cannot reproduce colors faithfully.

Setting the CAMERA MENU



MATRIX1 : BT.709
MATRIX2: BT.2020



SIMUL MODE(E) : NORMAL

OCP-300 [Video1] Gamma → Mode : NOR, Step : 0.45
[Color] Matrix → Matrix Select : 2 (4K system side)
[SML Color] Matrix → Matrix Select : 1 (HD system side)

[Operating method]
- On the Video1 screen, changing the Gamma Step setting values controls the 4K output and the HD output simultaneously.
- On the Detail screen, the 4K output and the HD output is simultaneously controlled.
- On the SML Detail screen, the HD output is controlled.
- On the Color screen, the 4K output and the HD output is simultaneously controlled.
- On the SML Color screen, the HD output is controlled.
- Controlling the SML Video is not possible.

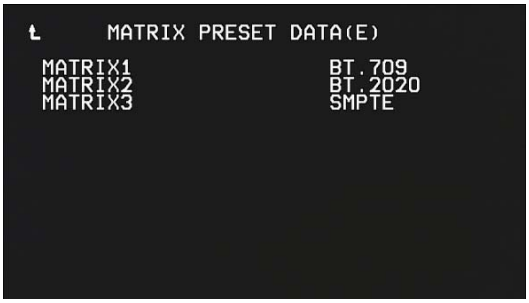
■ *When SIMUL MODE is INDEP GAMMA*

For the control items of Detail and Color, individual setting and control is possible for the 4K output and the HD output.
For the HD output system, individual setting and control of SML Knee, SML White Clip, SML Gain, SML Gamma, and SML Ped are possible on the SML Video page.
On the Video1 and Video2 pages, individual control of the 4K output is conducted for Master Gain, Master Gamma, Step Gamma, Master Ped, White Clip, Total Knee Point/Slope, and Smooth Knee. However, the RGB GAIN, PED, FLARE, etc. are simultaneously controlled for the 4K output and the HD output.

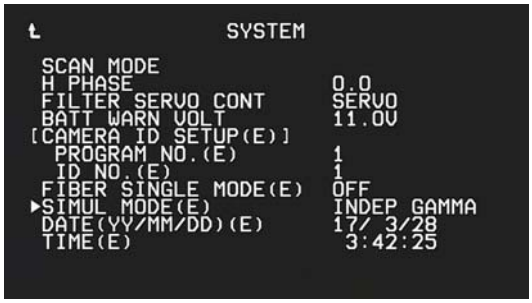
Simultaneously, the 4K output can be outputted in HDR (HLG) and BT.2020 color gamut setup, and the HD output can be output in SDR, BT.709 setup suitable for current broadcasting.

[Example]
4K output BT.2100 (HDR : HLG), Color space : BT.2020
HD output BT.709 (SDR), Color space : BT.709
Reference) The monitor to display 4K output must support HDR (HLG) and Color space BT.2020.
A monitor without support cannot reproduce the brightness and colors faithfully.

Setting the CAMERA MENU



MATRIX1 : BT.709
MATRIX2: BT.2020



SIMUL MODE(E) : INDEP GAMMA

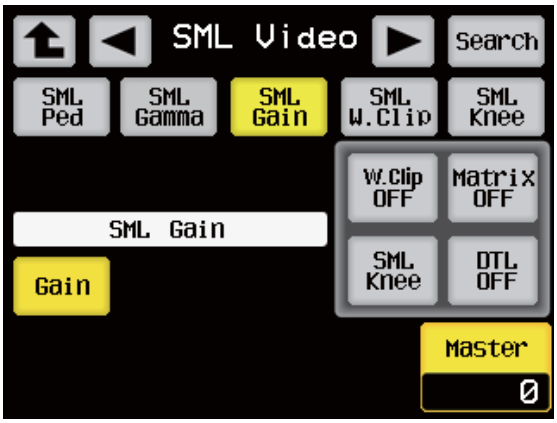
OCP-300 [Video1] Gamma → Mode : CSTM5 (HLG), Step : ON
(If HLG is assigned to CUSTOM GAMMA#5)
[Color] Matrix → Matrix Select : 2 (4K system side)
[SML Color] Matrix → Matrix Select : 1 (HD system side)

[Operating method]
- After adjusting the 4K output the HD output is adjusted using the SML Video, SML Detail, and SML Color items.
- Functions allocated to the OCP used during standard operation (R/G/B GAIN, RGB FLARE, RGB PED, and MASTER PED) are controlled for both the 4K output and the HD output. Therefore, individual settings are not necessary.
- When focusing on the HDR image, it is more effective to increase the incident light by opening the IRIS slightly more than usual. However, image with standard dynamic range will tend to have over-exposure.

HDR image

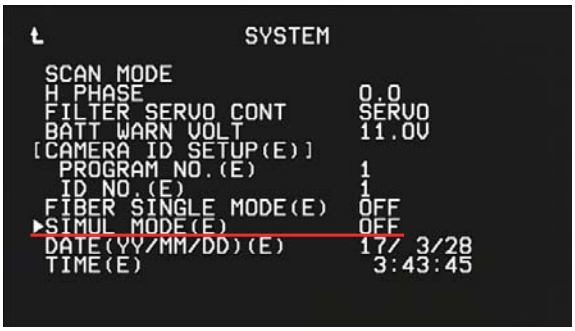
SDR image

In this case, you can reproduce an appropriate video level and reduce the overexposure by adjusting the SML Gain and SML Knee for the SDR video.



[When the AHD (Auto Hue Detect) function is used]
A function to automatically detect the hue which is the target for the SKIN TONE DTL, COLOR DTL, and CUSTOM COLOR functions is called AHD (Auto Hue Detect).
On the CCU PM OUTPUT, a zebra pattern is superimposed on the target hue that is automatically detected.
In this case, the PM OUTPUT indicates the image output of the HD system. Therefore, the zebra pattern indicates the detected hue of the HD output system (SML).
When SIMUL MODE is OFF, the 4K system becomes equal to the HD system. Therefore, hue selection of both systems become the same.
When SIMUL MODE is set to NORMAL or INDEP GAMMA, and when different color gamuts are set for the 4K output and the HD output, the target hue might become different. In that case, check and fine-adjust the detected hue by following this procedure.

Turn off the SIMUL MODE of CAMERA MENU.



Monitor the CCU PM OUTPUT video and perform AHD to detect the hue of the target object.

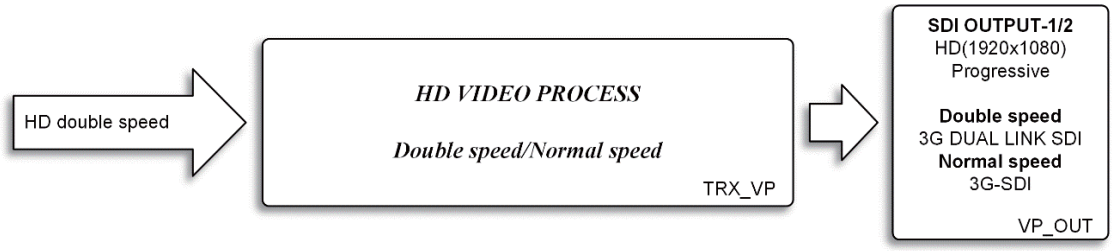
Check the zebra pattern to see if the target hue is detected properly. Make fine adjustments of HUE, if necessary. The target hue is the same because the 4K system and the HD system have the same detection system. The 4K output is now optimized.

Return the SIMUL MODE of the CAMERA MENU to NORMAL or INDEP GAMMA.
Indicate the zebra pattern on the CCU PM OUTPUT and check the detected hue of the HD output system. If necessary, manually adjust the HUE or execute AHD, to optimize the HD output.
At this time, the 4K system and the HD system are individually executing the image processing. Therefore, the settings of HD system (SML side) do not affect the 4K system.

Simultaneous operation during HD double speed output

This camera system supports HD double speed output as standard.

● The following figure shows the video output when the “HD SIMUL” option is not implemented in the CCU.



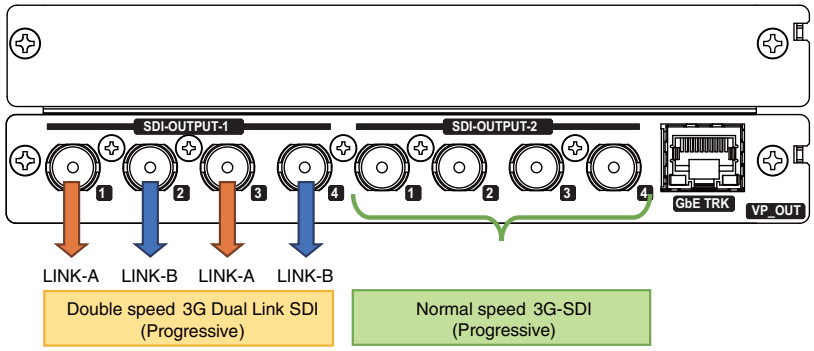
HD double speed behaviour for the standard configuration

The double speed output or normal speed output can be selected for the output of SDI OUTPUT-1 or SDI OUTPUT-2. The double speed output for this case is 1920x1080 Progressive scan, 3G-SDI DUAL LINK format, and the normal speed output is 1920x1080 Progressive scan, 3G-SDI format.

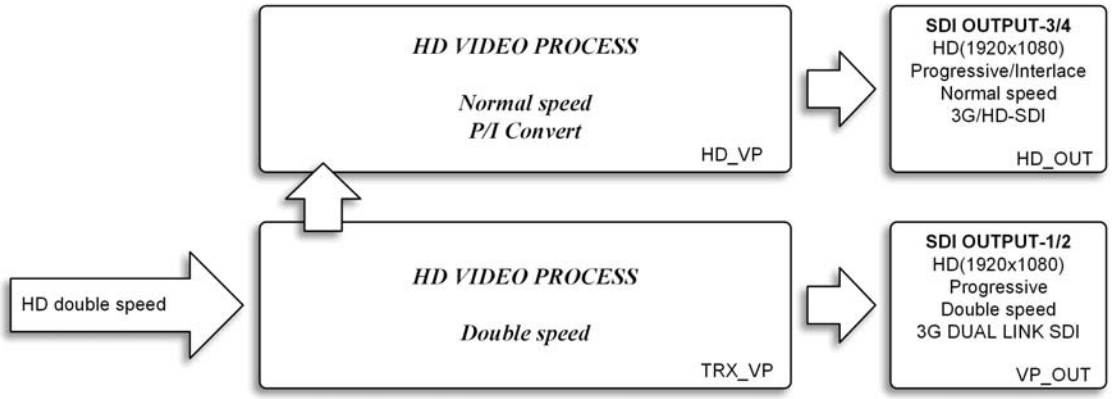
Example of output assignment)

SDI OUTPUT-1				SDI OUTPUT-2			
Image size	Freq.	Scan	MAPPING	Image size	Freq.	Scan	MAPPING
1920x1080	119.88	Progressive	EVS DL Multicam LSM 3G LVL-A	1920x1080	119.88	Progressive	EVS DL
					59.94	Progressive	3G LVL-A
					59.94	Progressive	3G LVL-B
1920x1080	100.00	Progressive	EVS DL Multicam LSM 3G LVL-A	1920x1080	100.00	Progressive	EVS DL
					50.00	Progressive	3G LVL-A
					50.00	Progressive	3G LVL-B

* The compatible device with connection for the double speed output the EVS EVS PRODUCTION SERVER XT-3.
“EVS” and “XT-3” are registered trademarks of EVS, Belgium.



● The following figure shows the video output when the “HD SIMUL” option is implemented in the CCU..



HD double speed behaviour when the SIMUL option is implemented

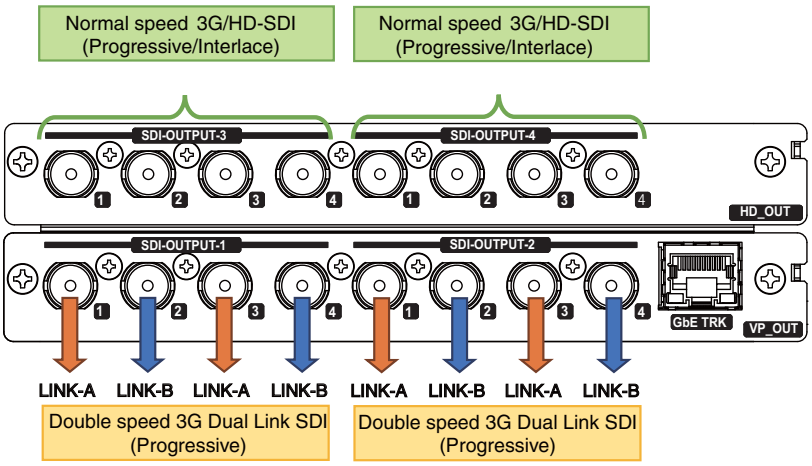
Selecting the double speed output or the normal speed output is possible for the SDI OUTPUT-1 and SDI OUTPUT-2 output, and select the normal speed output for the SDI Output.3 and SDI Output.4. At this time, the double speed output is 1920 x 1080 Progressive scan in 3G-SDI DUAL LINK format, and the normal speed output is 1920 x 1080 Progressive scan in 3G-SDI or 1920 x 1080 Interlace scan in 1.5G-SDI or 3G-SDI..

Example of output assignment)

SDI OUTPUT-1/2				SDI OUTPUT-3/4			
Image size	Freq.	Scan	MAPPING	Image size	Freq.	Scan	MAPPING
1920x1080	119.88	Progressive	EVS DL Multicam LSM 3G LVL-A	1920x1080	59.94	Progressive	3G LVL-A
						Progressive	3G LVL-B
						Interlace	3G LVL-A
						Interlace	3G LVL-B
						Interlace	HD-SDI
1920x1080	100.00	Progressive	EVS DL Multicam LSM 3G LVL-A	1920x1080	50.00	Progressive	3G LVL-A
						Progressive	3G LVL-B
						Interlace	3G LVL-A
						Interlace	3G LVL-B
						Interlace	HD-SDI

* The compatible device with connection for the double speed output is the EVS PRODUCTION SERVER XT-3.
“EVS” and “XT-3” are registered trademarks of EVS, Belgium.
Progressive 3G LVL-A/B is YCbCr 4:2:2, Interlace 3G LVL-A/B is RGB 4:4:4.

When conventional interlace double speed output is played in slow motion, vertical interpolation is used to remove the vertical jitter, but with deterioration of resolution due to the Four Line Filter process. However, with progressive double speed, there is no deterioration of resolution and smooth video can be played in slow motion.



The following is the specification of each LINK signal in the double speed Dual Link mode.

LINK-A (1st frame)	1920x1080 Progressive 59.94/50 3G-SDI Level-A
LINK-B (2nd frame)	1920x1080 Progressive 59.94/50 3G-SDI Level-A

The following is an example of the double speed DUAL LINK setting of the EVS XT-3.

SERVER TAB

Field rate	59.94Hz or 50Hz
Resolution	1080p

CHANNELS TAB

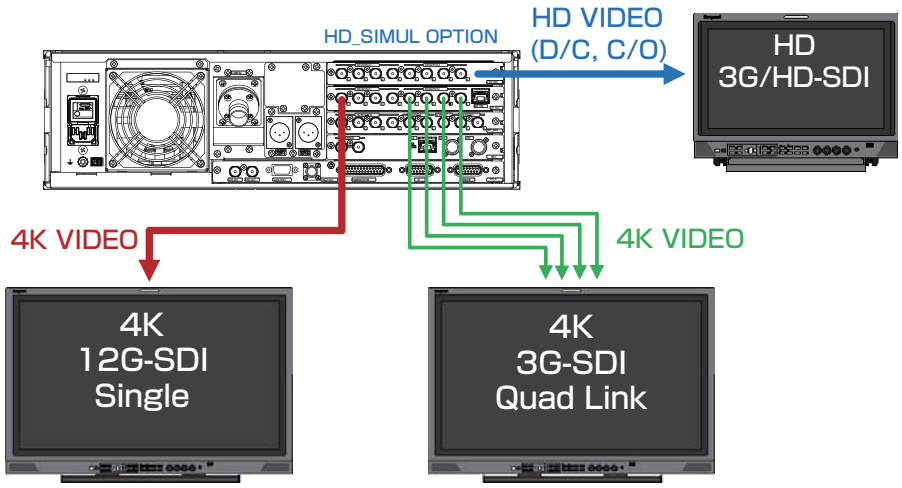
Base Config	Multicam LSM
3D	No
3G/Dual	3G Level-A

The EVS setup for double speed DUAL LINK may be different depending on the version of the XT-3. Please contact EVS for the latest setup information.

7.10 12G SDI option

Overview and implementation requirements

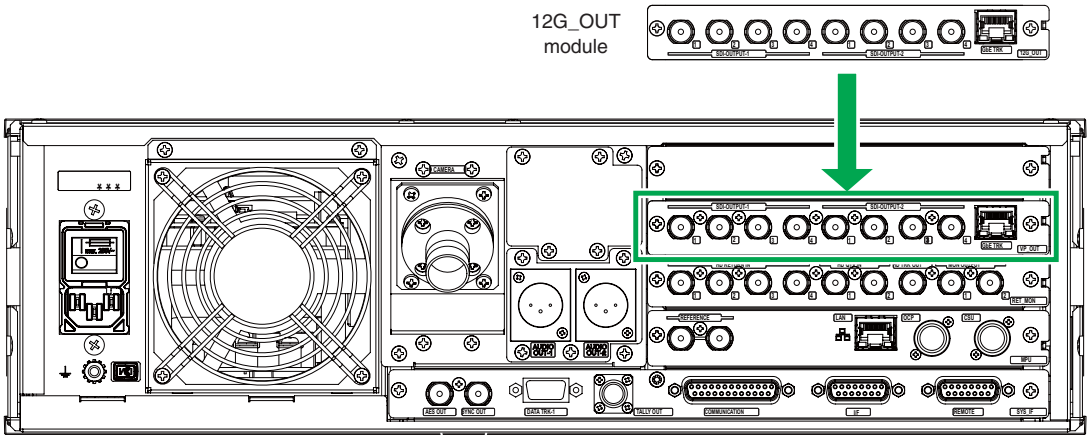
All those SDI rates of HD-SDI/3G-SDI/12G-SDI can be supported by Implementing the “12G OUT” option into the CCU-430. You can also build a flexible system since 4K 12G-SDI and 3G-SDI QUAD LINK can be output simultaneously.



Example of system configuration

In the above example, “HD SIMUL” option is also implemented at the same time.

The rear module [VP_OUT] of CCU-430 is replaced with [12G_OUT] when the “12G OUT” option is implemented.



Caution

Insertion/removal method of the rear-side module

When installing an option module, consult with our engineer or the sales agency's engineer. If the customer installs a module on his own, please fully understand that there is a risk of module damage and take the following procedure.

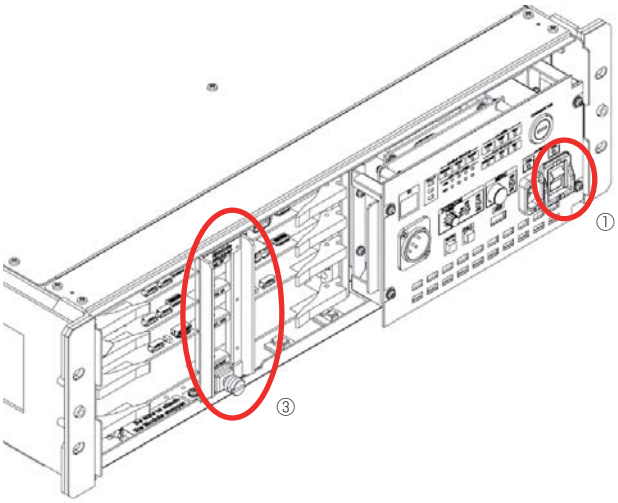
Do not touch the printed board and individual components of the module.

[Preparation] Discharge any static electricity in your body and wear a grounding wrist band.

1 Turn off the main power of the CCU.

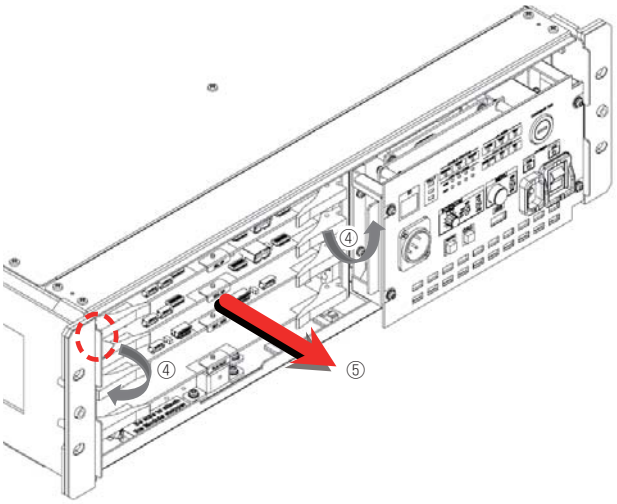
2 Remove the cover on the front side of the CCU.

3 Remove the module retainer from the CCU.

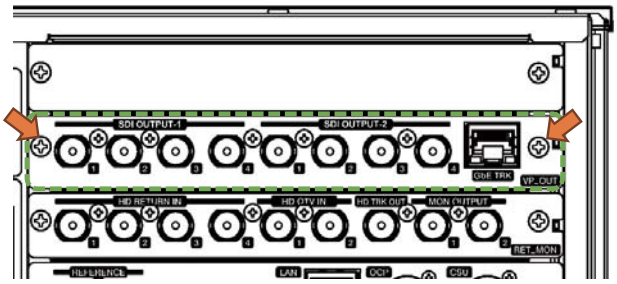


4 Pull the card puller of the TRX_VP module toward you and release the locks at the same time. Be sure not to pinch the yellow optical fibers on the left side.

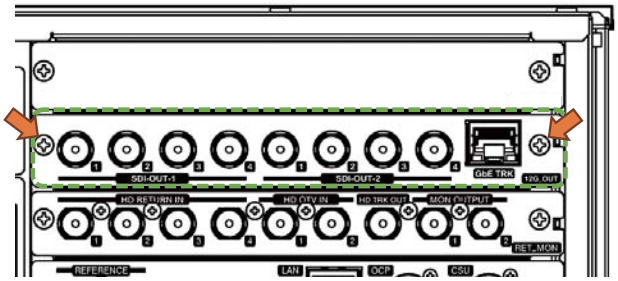
5 Pull the TRX_VP module about 5cm toward you.



6 Remove the screws fixing the VP_OUT module on the back side of the CCU to take the module away from CCU.

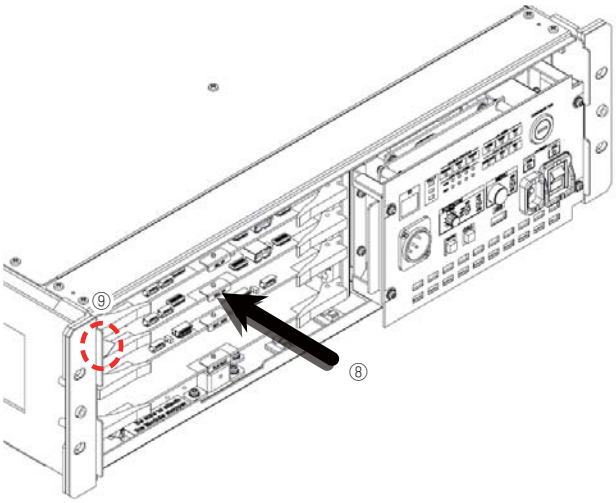


7 Insert the 12G_OUT module and fix it to CCU.



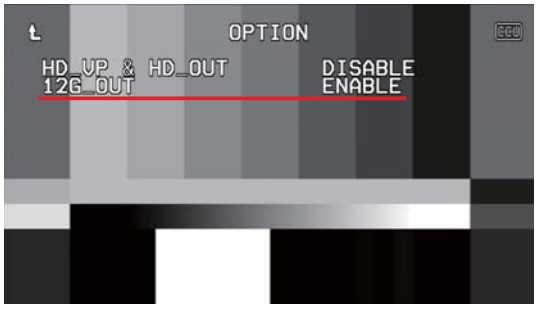
8 Insert the TRX_VP module into the CCU. Be sure not to pinch the yellow optical fiber on the left side.

9 Install the front cover after installing the module retainer to the CCU.



Turn on the main power of CCU. Open the CCU MENU and check if the OPTION is enabled.

INFORMATION → OPTION



If 12G_OUT is set to ENABLE, the optional module should be recognized and the functions are enabled.

Assigning video outputs

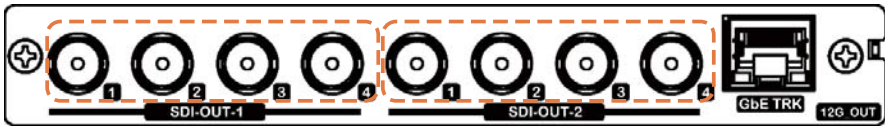
This section explains the video output assignment when the “12G OUT” option is implemented.

12G-SDI output format: SMPTE ST2082 compatible
ST 2082-1 12 Gb/s Signal/Data Serial Interface - Electrical
ST 2082-10 2160-line Source Image and Ancillary Data Mapping for 12G-SDI

IMAGE SIZE	FREQ&SCAN	SAMPLING
3840×2160	59.94 Progressive	YCbCr 4:2:2
	50.00 Progressive	YCbCr 4:2:2
	25.00 Progressive	RGB 4:4:4
	25.00 Progressive	RGB 4:4:4
	24.00 Progressive	RGB 4:4:4
	23.98 Progressive	RGB 4:4:4

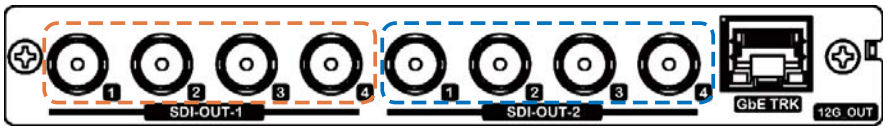
Only when 3840 x 2160 3G-SDI Level-A is selected for the OUT-1/2 FORMAT in the CCU MENU, the 12G-SDI output setting becomes available.
4K 3G-SDI QUAD LINK or 12G-SDI output can be assigned separately to the SDI OUTPUT-1 and the SDI OUTPUT-2 respectively.
When 12G-SDI is selected for one system and QUAD LINK output is allocated to other system, QUAD LINK output becomes 3G-SDI Level-A 2SI format.

● When 12G-SDI is assigned to both SDI OUTPUT-1 and SDI OUTPUT-2



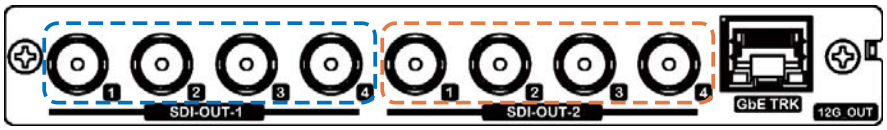
12G-SDI 4x 12G-SDI 4x

● When 12G-SDI is assigned to SDI OUTPUT-1, and QUAD LINK is assigned to SDI OUTPUT-2



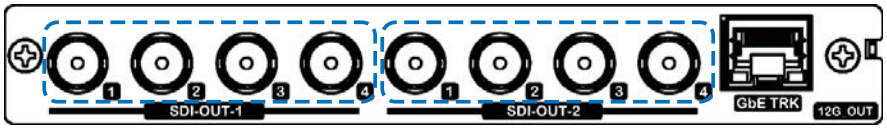
12G-SDI 4x 3G-SDI QUAD LINK 4x (Level-A 2SI)

● When QUAD LINK is assigned to SDI OUTPUT-1, and 12G-SDI is assigned to SDI OUTPUT-2



3G-SDI QUAD LINK 4x (Level-A 2SI) 12G-SDI 4x

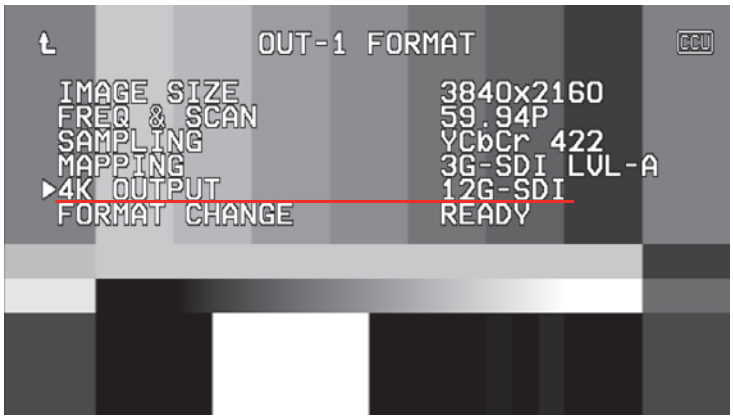
● When QUAD LINK is assigned to both SDI OUTPUT-1 and SDI OUTPUT-2



QUAD LINK 4x QUAD LINK 4x
(3G Level-A/B, 2SI/SQD or HD Quad Link SQD)

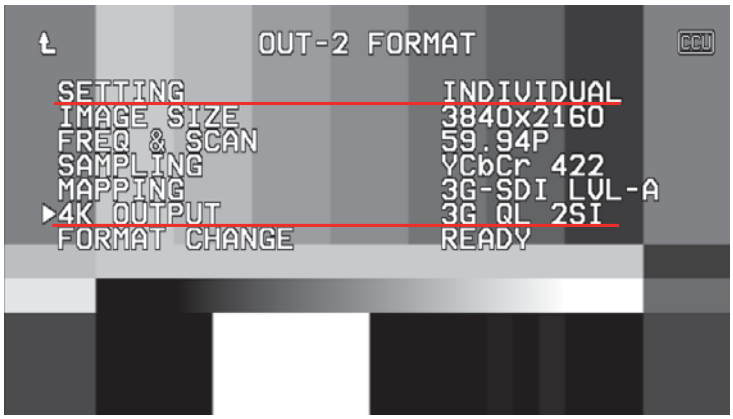
How to assign outputs from the CCU MENU

The assignment for SDI OUTPUT-1 and SDI OUTPUT-2 is performed from the CCU MENU.
CCU MENU → SYSTEM SETTING (1/2) → OUT-1 FORMAT



12G-SDI is displayed as one of options for 4K OUTPUT and can be selected only when IMAGE SIZE, FREQ & SCAN, SAMPLING, and MAPPING suitable for 12-SDI output are selected.
In the above case, the 4K 12G-SDI signal output of 59.94Hz Progressive is assigned to SDI OUTPUT-1.

The assignment to SDI OUTPUT-2 is performed from CCU MENU in the same manner.
CCU MENU → SYSTEM SETTING (1/2) → OUT-2 FORMAT



If the SETTING item is “SAME AS OUT-1”, the format is the same as the format set in OUT-1 FORMAT. The IMAGE SIZE, FREQ & SCAN, SAMPLING, MAPPING, and 4K OUTPUT items cannot be selected.

If the SETTING item is “INDIVIDUAL”, you can select the items that can be changed. In this example, “3G QL 2SI” and “12G-SDI” can be selected for the 4K OUTPUT. IMAGE SIZE, FREQ & SCAN, SAMPLING, and MAPPING cannot be changed.

6G-SDI is selected when the 4K QUAD LINK (P/PsF format) is output by 1.5G HD-SDI signals; however, it is not supported by this system because HD QUAD LINK does not comply with SMPTE standards. 4K QUAD LINK by 1.5G HD-SDI signals is Square Division for the output.

Combined application with HD SIMUL option

"12G OUT" option can be concurrently used with the "HD SIMUL" option.
Please refer to the following table for the combinations that can be output during the implementation of each optional module.

	4K QUAD LINK	4K 12G-SDI HD	HD DOWN-CONV	HD CUTOUT	Simultaneous output of HD D/C and C/O	Simultaneous output of 4K and HD
(A) CCU-430 standard configuration	✓		✓			
(B) HD SIMUL optional implementation	✓		✓	✓	✓	✓
(A) + 12G OUT module implementation	✓	✓	✓			
(B) + 12G_OUT module implementation	✓	✓	✓	✓	✓	✓

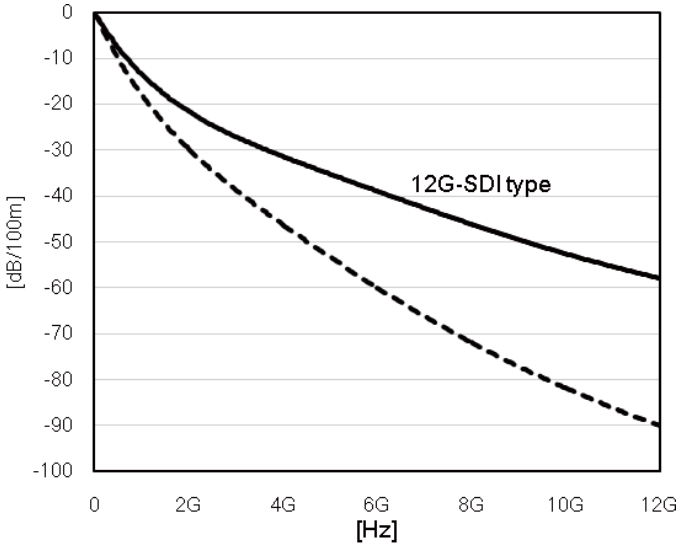
12G-SDI coaxial cable and BNC connector

When conventional coaxial cable attached with BNC connectors is used, the attenuation and the insertion loss of the 12G-SDI signal (transmission rate is four times faster than 3G) cannot be satisfied.
For the attenuation on improvement of approximately 20 dB when compared with the conventional value is required. For the return loss, satisfying SMPTE2082-1 regulation is required.

The signals can be transmitted for a short distance even if a conventional 3G-SDI supported coaxial cable is used. But pay attention to the quality and deterioration of the cable. The signals might be transmitted by 3G-SDI without any problem. However, if might not be transmitted at all by 12G-SDI, especially when there is deterioration or crimping failure in the shield.

Currently, coaxial cables and BNC connectors which correspond to 12G-SDI transmission are sold or their prototypes are released from several makers. They are developed for the purpose of transmitting 12G-SDI signal, and their features are optimized.
In addition, if a relay adapter (jack to jack) not corresponding with 12G-SDI is used when extending the cable, the signal quality may severely deteriorate.

Hence, design the system using 12G-SDI-supported cables and connectors when you configure a 12G-SDI system.



Attenuation of coax cable

The figure on the left shows an example of the frequency and attenuation of 75Ω coaxial cable.
The cable property is different depending on cable manufacturers, so select the type suitable for your purpose.

Moreover, the total performance of the coaxial cable assembled with BNC connectors is important.

Transmission distance

The cable transmission distance of 12G-SDI is not specified in the SMPTE ST2082 standard. This optional module is on the signal sender side, so it must comply with the specification of the SDI physical layer in SMPTE2082-1.

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(Amendment1)

Peak-to-Peak Amplitude	800mV ± 10%
DC offset	0.0V ± 0.5V
Overshoot of Rising Edge	Up to 10%
Overshoot of Falling Edge	Up to 10%
Rise Time / Fall Time	Up to 45ps
Rise/Fall Mismatch	Up to 18ps
Timing Jitter	Up to 8UI (674ps)
Alignment Jitter	Up to 0.3UI (25.3ps)

Return Loss

Frequency	Value
F0 to F1 (5M to 1.485GHz)	-15 dB
F1 to F2 (1.485G to 3GHz)	-10 dB
F2 to F3 (3G to 6GHz)	-7 dB
F3 to F4 (6G to 12GHz)	-4 dB

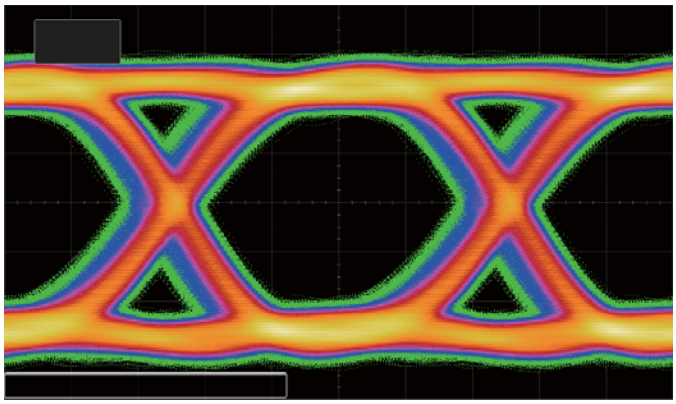
The conditions for measurement are specified as a coaxial cable length of 1m and color bar signal for the video source.

If the device that sends out signals satisfies the above specification, the maximum transmittable cable length is determined by the following two points.

- The properties of the SDI cable equalizer, return loss, and insertion loss on the receiver side.
- The properties of the coaxial cable with BNC connectors used for transmission.

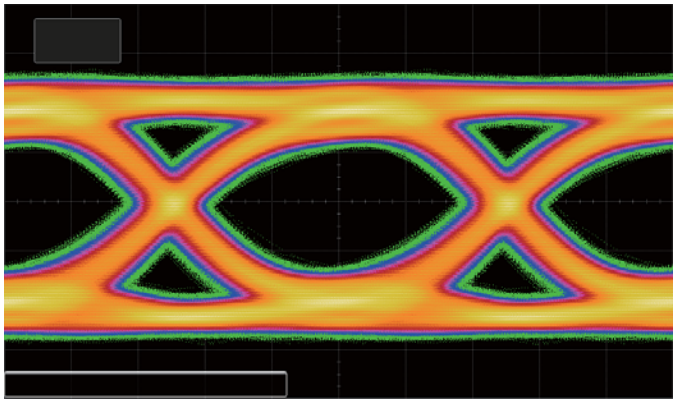
Hence, the maximum transmittable cable length is not defined in the specification of this device.

The change in 12G-SDI signal reception waveform by the length and quality of the cable

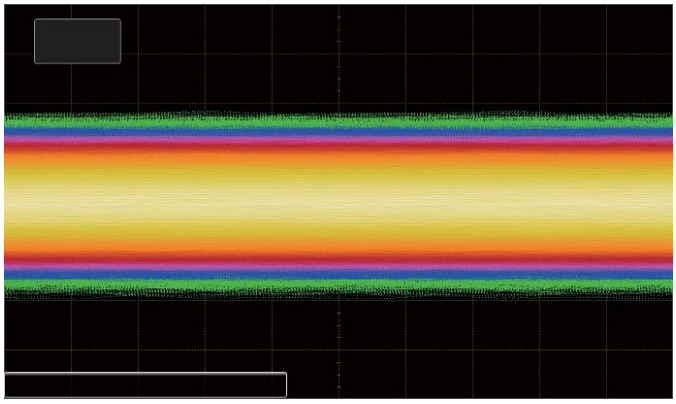


Serial digital signal waveform when 12G-SDI is successfully received on the receiver side.

EYE aperture is not enough.



Serial digital signal waveform when the transmission distance extends or when the cable quality has a problem. Because the reception level decreases, the EYE aperture becomes smaller, and the waveform rise/fall time increases, there is a possibility of failing the normal reception. However, the conditions are corrected by the cable equalizer at the reception device side, and thus the signals often can be received normally.



Serial digital signal waveform when the transmission distance is expanded, or there is a significant problem in the quality of the cable.

In this case, the EYE aperture cannot be identified and it is almost impossible to receive it as a serial digital signal.

TROUBLE SHOOTING and MAINTENANCE

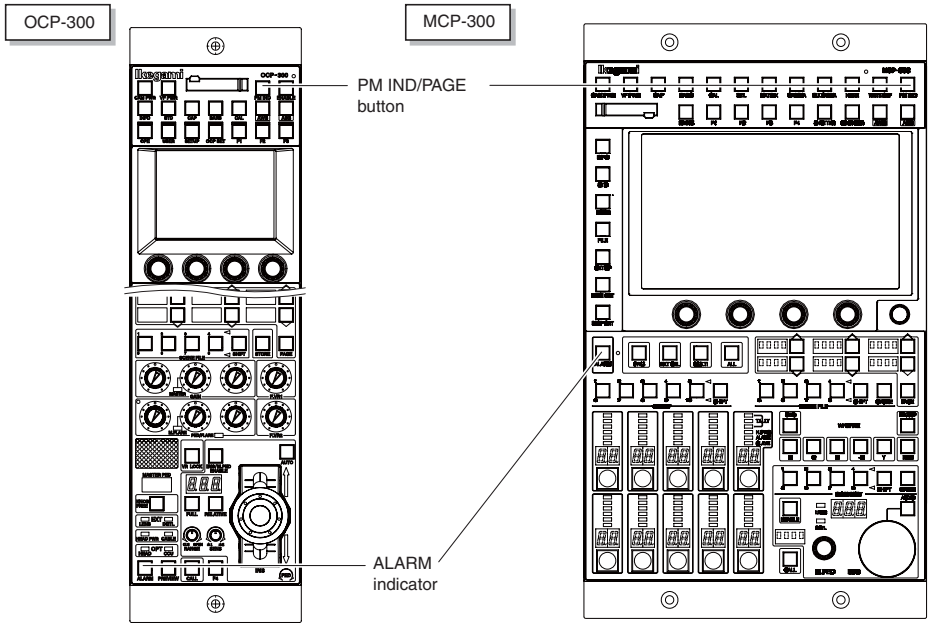
8

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

The CCU-480 is equipped with a self diagnostic function which monitors whether the CCU and camera are running normal. This function is activated at the same time as the power of CCU is turned on and always active during the operation.
If abnormalities occur in the CCU or camera, they are immediately detected by the self-diagnosis function and cause the ALARM indicator on the control panel to flash. At this time, the diagnostic information that specifies the site of abnormality on the picture monitor.

Note:

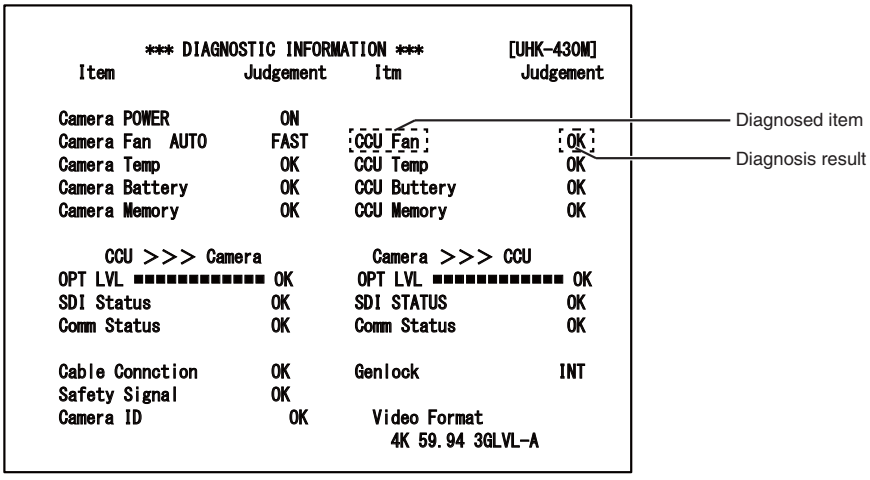
Even if the ALARM indicator does not flash, you can check whether the CCU and camera are running normal by pressing the PM IND/PAGE switch on the control panel twice to display the self diagnostic information on the Picture Monitor.



CCU Self Diagnostic Information

■ *Self Diagnostic Information Screen*

The following is the Self Diagnostic Information Screen of the CCU.



List of Self Diagnostic Information

The following tables list the self diagnostic information for the standard specification.

List of Self Diagnostic Information

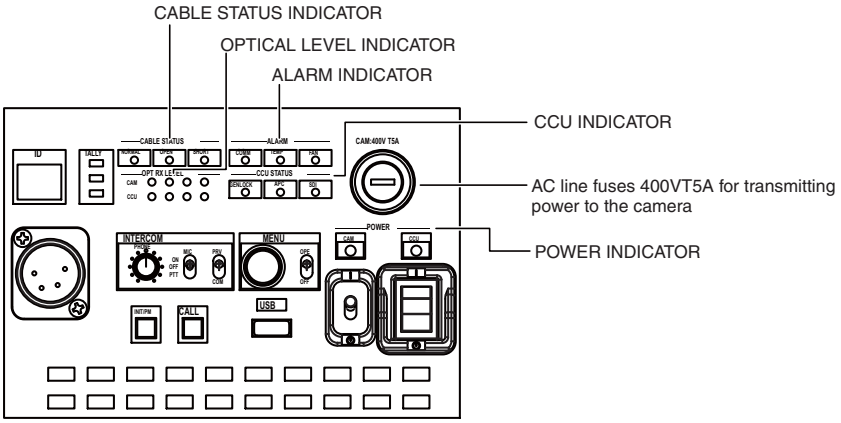
Diagnosed Item		Description	Diagnosis Result	Meaning
Camera Power		Power status of the camera	ON	The camera is powered ON.
			OFF	The camera is powered OFF.
Camera Fan		Rotating status of fan of the camera	AUTO SSLOW	Super-slow in auto mode
			AUTO SLOW	Slow in auto mode
			AUTO NOR	Normal in auto mode
			AUTO FAST	Fast in auto mode
			FAST	Fast in manual mode
			NG	Fan has stop.
Camera Temp		Internal temperature of the camera	OK	Normal
			NG	The internal temperature is abnormally.
Camera Battery		Status of the battery in the MPROC module of the camera	OK	Normal
			NG	The backup battery voltage is low.
Camera Memory		Status of the RAM in the MPU module of the camera	OK	Normal
			NG	Data in the module is abnormally.
CCU Fan		Rotating status of the fans on the rear and inside of the CCU	OK	Normal
			NG	Internal cooling fan either has stopped.
CCU Temp		Internal temperature of the CCU	OK	Normal
			NG	The internal temperature is abnormally.
CCU Battery		Status of the battery in the CCU MPU module and TRX_VP module	OK	Normal
			NG	The backup battery voltage is low.
CCU Memory		Status of the RAM in the CCU MPU module and TRX_VP module	OK	Normal
			NG	Data in the module is destroyed.
CCU >>> Camera (CCU to Camera transmission)	OPT Level	Optical signal level sent from the CCU to the camera (Detect the optical receiving level at the camera side and display the status).	OK	Good
			ATTEN	The amount of light received decreased.
			WARN	The amount of light received significantly decreased.
			NG	Light cannot be received.
	SDI Status	Monitors the data transmission status between CCU and the camera.	OK	Normal
			NG	Detect CRC error
	Comm Status	Status of the command signal sent from the CCU to the camera	OK	Normal
			NG	No command signals are sent, or a CPU error occurs.
Camera >>> CCU (Camera to CCU transmission)	OPT Level	Optical signal level sent from the camera to the CCU (Detect the optical receiving level at the CCU side and display the status).	OK	Good
			ATTEN	The amount of light received decreased.
			WARN	The amount of light received significantly decreased.
			NG	Light cannot be received.
	SDI Status	Monitors the data transmission status between CCU and the camera.	OK	Normal
			NG	Detect CRC error
	Comm Status	Status of the command signal sent from the camera to the CCU	OK	Normal
			NG	No command signals are sent, or a CPU error occurs.

Diagnosed Item	Description	Diagnosis Result	Meaning
Cable Connection	Optical fiber composite camera cable connection status between the camera and the CCU	OK	Normal
		OPEN	Cable is not connected, or there is an open.
		SHORT	A short circuit occurs in the cable.
Safety signal	Status of the safety signal sent from the camera to the CCU	OK	Normal
		NG	The safety signal is not received, or the connected camera is not supported by this CCU.
Camera ID	Status of the model identification signal sent from the camera to the CCU	OK	Normal
		NG	The model identification signal is not received, or the connected camera is not supported by this CCU.
Genlock	Status of external SYNC signal	INT	No external SYNC signals are input (operation is performed with internal SYNC signals.) Internal mode
		1080P59	When external SYNC signal is 1080P59.94
		1080I59	When external SYNC signal is 1080i59.94
		1080P23	When external SYNC signal is 1080P23.98
		1080P23SF	When external SYNC signal is 1080P23.98SF
		1080P29	When external SYNC signal is 1080P29.97
		720P59	When external SYNC signal is 720P59.94
		1080P50	When external SYNC signal is 1080P50
		1080P25	When external SYNC signal is 1080P25
		1080I50	When external SYNC signal is 1080i50
		720P50	When external SYNC signal is 720P50
		UNKNOWN	External synchronization signals have been input, but cannot be identified.

Note:

sF : segmented Frame

8.2 Indicator on the Front of CCU Lights



■ *When the OPTICAL LEVEL (OPTICAL RX LEVEL) indicator yellow or red lights*

Indicators next to "CAM" indicate the reception status on the camera side, and indicators next to "CCU" indicate the reception status on the CCU side.

Cause	Action
The optical connector must be dirty. The lighting state of the OPTICAL RX LEVEL indicator changes.	Clean the optical connector end of the cable or the equipment side.

■ *When the (CABLE) OPEN indicator lights*

Cause	Action
The (CABLE STATUS INDICATOR) OPEN indicator lights when the camera cable is not connected or there is an open.	Check if the camera cable is properly connected or there is no open. If there is an open, replace the camera cable with a new one.

■ *When the (CABLE) SHORT indicator lights*

Cause	Action
SHORT indicator (CABLE status indicator) lights up when the fiber cable is damaged or grounded due to water drops, etc.	Make sure the fiber cable is not damaged and the connector mating part is not wet with water drops.If the optical connector is wet, dry it and then clean it.

■ *When the FAN ALARM indicator lights*

Cause	Action
FAN ALARM indicator will light when the fan is in internal CCU has stopped.	Check if the fans are normal. If any of the fans is abnormal or the lifetime of the fan expires, replace it with a new one.

■ *When the TEMP indicator lights*

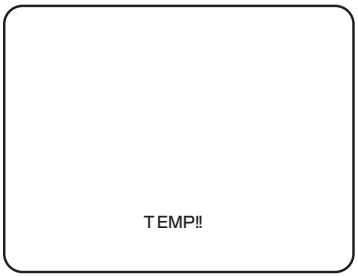
Cause	Action
The TEMP indicator lights when the CCU internal temperature is abnormally high. If the TEMP alarm is on and the operation is kept continued, causing the temperature increase even more, the warning is made with buzzer sounds.	When this indicator lights on, check that the ventilation hole on the front panel and the exhaust hole on the rear panel are not covered or clogged with dust. Avoid a place with direct sunlight.

Caution:

*1: If FAN ALARM and TEMP ALARM warnings are ignored and the operation is kept continued, it may cause shutdown of the power supply of the device, damage to the module, and other serious failure due to heat generation. Please stop the operation immediately.

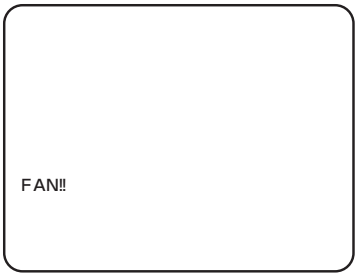
8.3 “TEMP!!” or “FAN!!” Displays on the VF Screen

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	The rotation of fan is slow or stopped.	(1) Foreign substance is entered in the wings of FAN, preventing it from rotating → Remove the foreign substance. (2) If FAN is broken. Replacement is necessary. *2

Caution:

*2 If FAN needs to be replaced, please contact to our service center or sales representatives.

Note:

The cooling fan is installed to prevent the temperature inside the camera from increasing.

8.4 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.

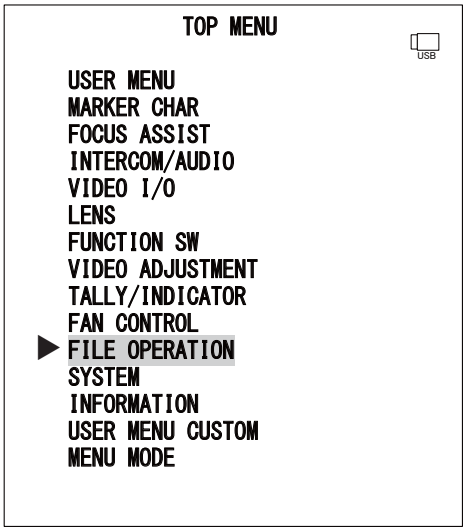
(2) Initializes the camera back to the initial factory setting (FACTORY SET FILE)
This initializes the camera back to the initial factory setting.

Use the Menu screen to change the settings. The setting method is described below.

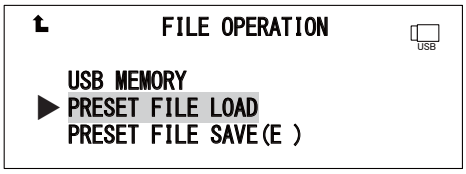
Set Value		Description
FILE SELECT	ENGINEER (default)	Initializes the state back to the user setting.
	FACTORY	Initializes the state back to the initial factory setting.
LOAD START	READY (default)	The state before initialization
	START	Starts initialization.
	CANCEL	Cancels initialization.

■ *Initialization of the Camera*

1 Turn the menu operation knob in the MAIN MENU (TOP MENU) to move the cursor to "FILE OPERATION". Then press the ENTER button to display the sub menu.

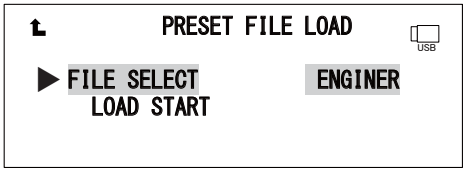


2 Turn the menu operation knob to position the cursor on “PRESET FILE LOAD”, and press the ENTER button.



3 Turn the menu operation knob to position the cursor on “FILE SELECT”, and press the ENTER button.

The cursor moves to the mode selection column.



4 Turn the menu operation knob to select the value (ENGINEER, FACTRY) to be set, and press the ENTER button.

The value is confirmed.

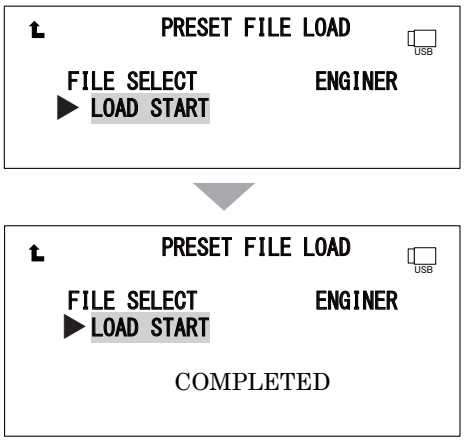
continues to the next page

5 The cursor automatically moves to "LOAD START", so press the ENTER button.

As the cursor moves to the mode settings, the display of mode setting value changes from "READY" to "START".

- If "CANCEL" is selected with the menu operation knob, the setting is canceled and "PRESET FILE LOAD" is ended.
- Selecting “START” displays “PUSH SET -> START” at the bottom of the screen.

Go to Step 6 when selecting “START”.



6 Press the ENTER button.

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”.

■ *Initialization of CCU*

Please refer to [Settings of PRESET FILE] under the Section 6.3 "Transition of Menu Screen".
Please refer to the operation manual of your device when performing from OCP or MCP.

Caution:

It is necessary to understand the following points before initializing this device.
(1) Initialization is not the same as "Restore" to the original settings.
(2) The initialization of the engineering setting items restores to a certain point in time, but the contents may be different from your wish.
If the conditions when the data is saved and conditions when the setting items are initialized are different, the settings items may not be as you desired.
(3) Restoring the factory settings may result in losing your settings.

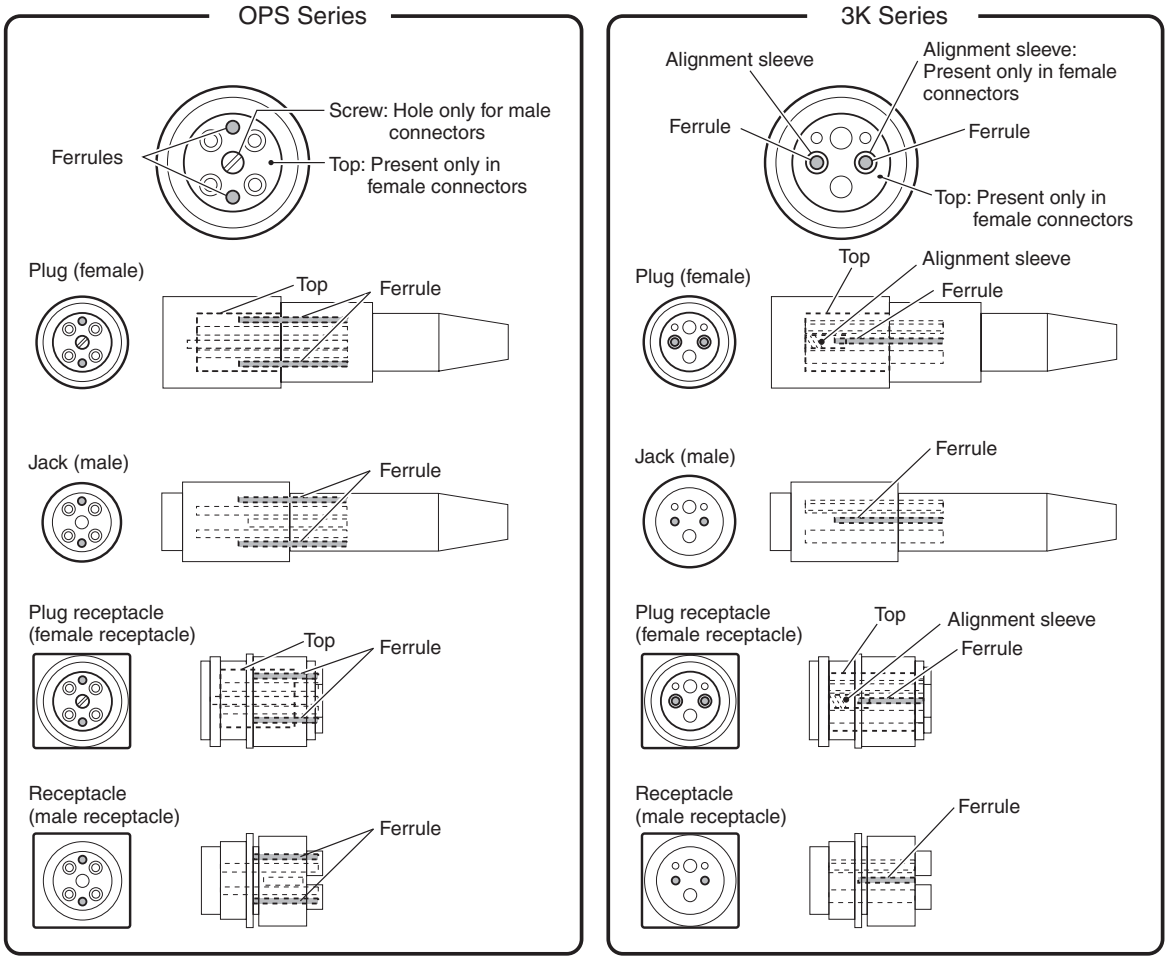
After understanding these points, if you still wish to perform initialization, please contact to our service center or sales representatives.

8.5 Cleaning Camera Connectors

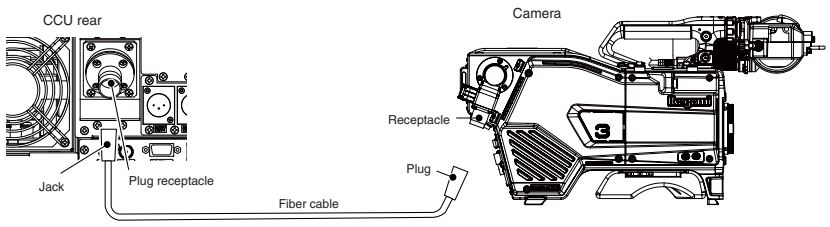
■ *Cleaning Optical Connectors*

The camera 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 camera 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*



●*Plug/Jack for Camera Connectors*



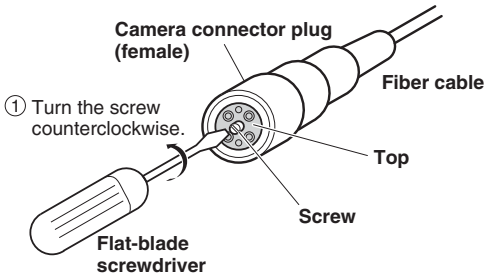
Clean the four sections: receptacle on the camera, plug receptacle on the CCU, and plug/jack on both ends of the camera cable. The cleaning method for male connectors differs from that for female connectors.

■ *OPS Series Connectors*

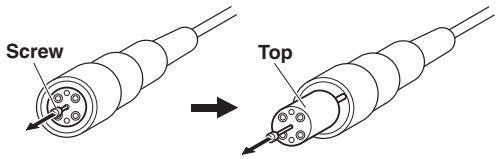
The following explains how to clean Ferrules using a Tajimi OPS series fiber cable plug (female) as an example.

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.

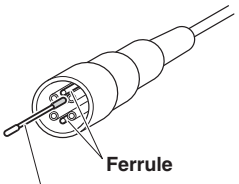


② Pull the screw to remove the top from the connector.

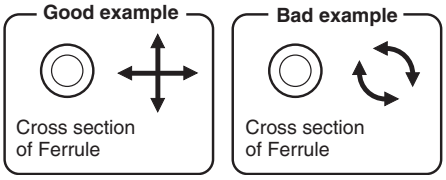
3 Wipe the Ferrule with a cotton swab dampened with alcohol.

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.

Since the male connector does not have frame, the steps 1, 2 and 6 the above are not necessary.

■ *3K Series Connectors*

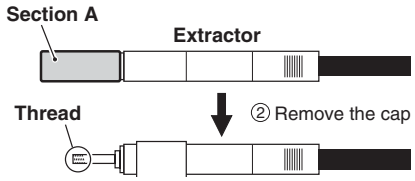
The following explains how to clean Ferrules using a Lemo 3K series camera cable plug (female) as an example.

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.

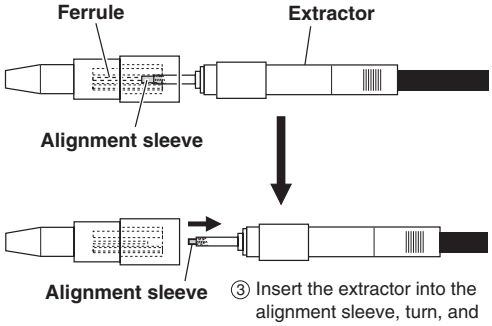
1 Prepare a dedicated extractor and place the extractor in a position parallel to the connector.

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.

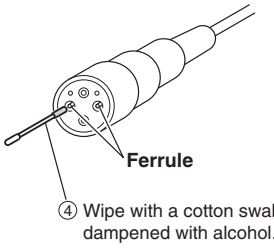
Leave the alignment sleeve attached to the extractor.

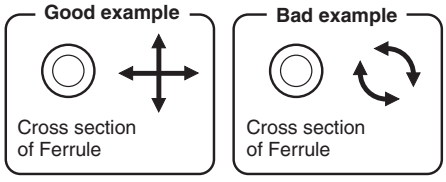


4 Wipe the Ferrule with a cotton swab dampened with alcohol.

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.

Male connectors have neither "top" nor "alignment sleeve"; therefore, steps 1 to 3 and 8 above are not required.

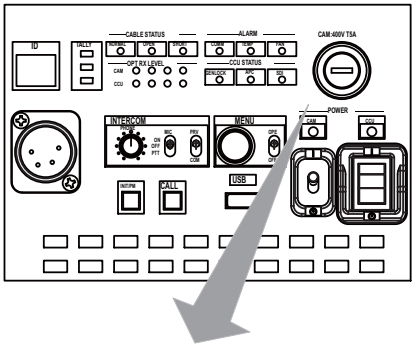
8.6 Replacing Fuses

While the AC power supply is properly input to this system and when the peripheral units are properly connected, a problem may occur such as the power supply disabled to be turned on, the power not transmitted to the camera, or the power alternately transmitted and stopped repeatedly to the camera. In such case, the fuse might be blown. If that occurs, replace the fuse by taking the following procedure.

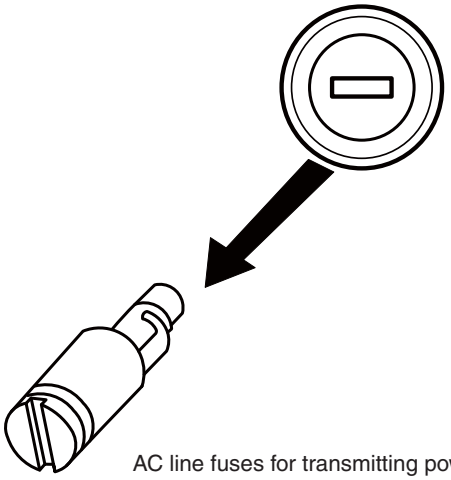
1 Make sure the MAIN POWER switch on the front of the CCU is turned "OFF."

2 Use a flat-blade screwdriver or the like to press and turn the fuse on the front of the CCU counterclockwise and remove it.

CCU front view



CAM: 400V T5A



AC line fuses for transmitting power to the camera head

3 Insert a new fuse into the fuse cap and turn it clockwise using a flat-blade screwdriver or the like until it seats firmly.

CAUTION:

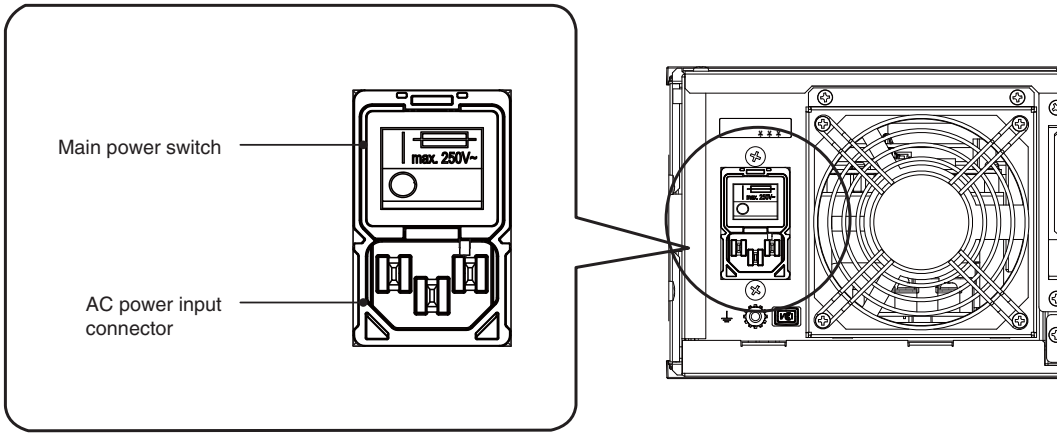
Use specified fuses or equivalent ones.
Fuse to be used
400V T5A (rating)
("T" in the rating indicates a time lag fuse.)

8.7 Replace the fuse in the AC inlet.

The power switch and fuse are built in the AC inlet on the back of CCU. This section explains how to replace the fuse in the AC inlet.

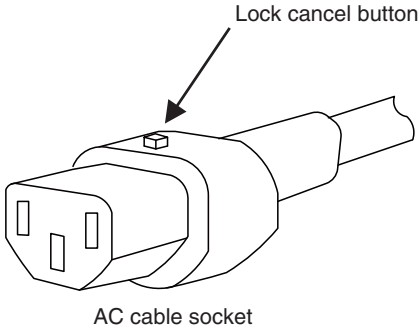
1 Turn off the camera and the power switch of CCU.

2 Turn off the main power switch of the back side of CCU.



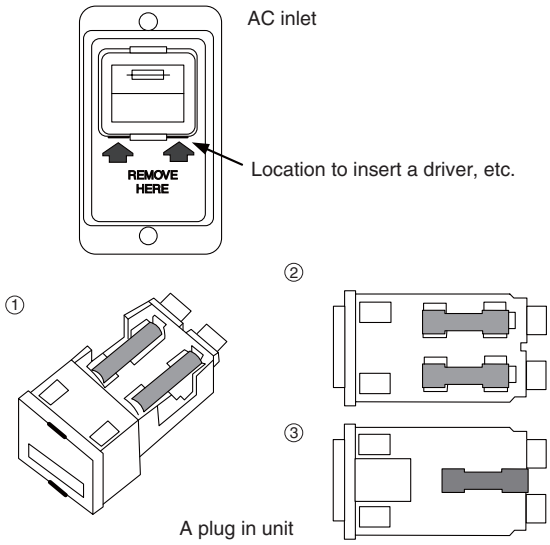
3 Remove the AC cable from the AC inlet.

The AC inlet of this product uses the AC socket with retaining mechanism. Press this lock cancel button and pull the socket toward the cable side to remove.



4 Removing the fuse

A fuse symbol is indicated on the switch of the plug-in unit. This symbol means that there is a fuse holder in the unit. Since the frame color of the plug-in unit is red, it is easy to distinguish the border from other parts (See the right figures). Insert a tool such as army knife and driver into the bottom of the border, and lightly pull it towards front to remove the plug-in unit (1). There are two fuse holders, P and N, on the top of the unit (2), and spare fuse hosing holder on the bottom of the unit (3).



5 After replacing the fuse, insert the plug-in unit into the AC inlet.

6 Insert the socket of the AC cable into the AC inlet, turn on the main power switch.

9

SPECIFICATIONS

9.1 UHK-430, CCU-430 Specifications

■ *Ratings*

	Item	Rating						Remarks
1	Scanning system	3840 x 2160 23.98P/29.97P/59.94P/24P/25P/50P 1920 x 1080 119.88P/100P						
2	Image sensor	2/3 inch CMOS sensor ×3						Total pixels 8M
3	Effective number of pixels	3840 x 2160 @ 4K 1920 x 1080 @ HD						
4	Sensitivity	F10 @ 4K 59.94P F11 @ 4K 50P F10 @ HD 59.94i F11 @ HD 50i						2000LX reflection rate 89.9%
5	Optical system	2/3 type, R,G,B Prizm						
6	Lens mount	2/3 type, Bayonet mount						BTA S-1005B, based.
7	Optical filter (ND)		1	2	3	4	5	
		ND	CLEAR	1/4	1/8	1/16	1/64	
8	Optical filter (CC)		A	B	C	D	E	
		CC	3200K	4300K	6300K	CROSS	OPTION	
9	VF	VFL201D, VFE741D, VFL701D						
10	Power source voltage	CAMERA DC + 11 to 17V						
		CCU AC100V /110V/117V/120V/230V/240V ±10%						
16	Ambient temperature	CAMERA Operation temperature : -20 °C to +45 °C CCU Operation temperature : 0 °C to +40 °C CAMERA Storage temperature : -20 °C to +60 °C CCU Storage temperature : -20 °C to +60 °C						
17	Ambient humidity	30% to 90%						No condensation.
18	EMI	FCC Class A						
19	External dimensions	CAMERA W 148.5 x H 243 x D 340						Not including projections.
		CCU W 483 x H 133 x D 454						Not including projections.
20	Weight	CAMERA CAMERA : approx. 4.6 kg						
		CCU : approx.19 kg						Not including options.
		2 Inch VF : approx.780 g						
		7 Inch VF : approx.1.5 kg						
		7.4 Inch VF : approx.1.6 kg						

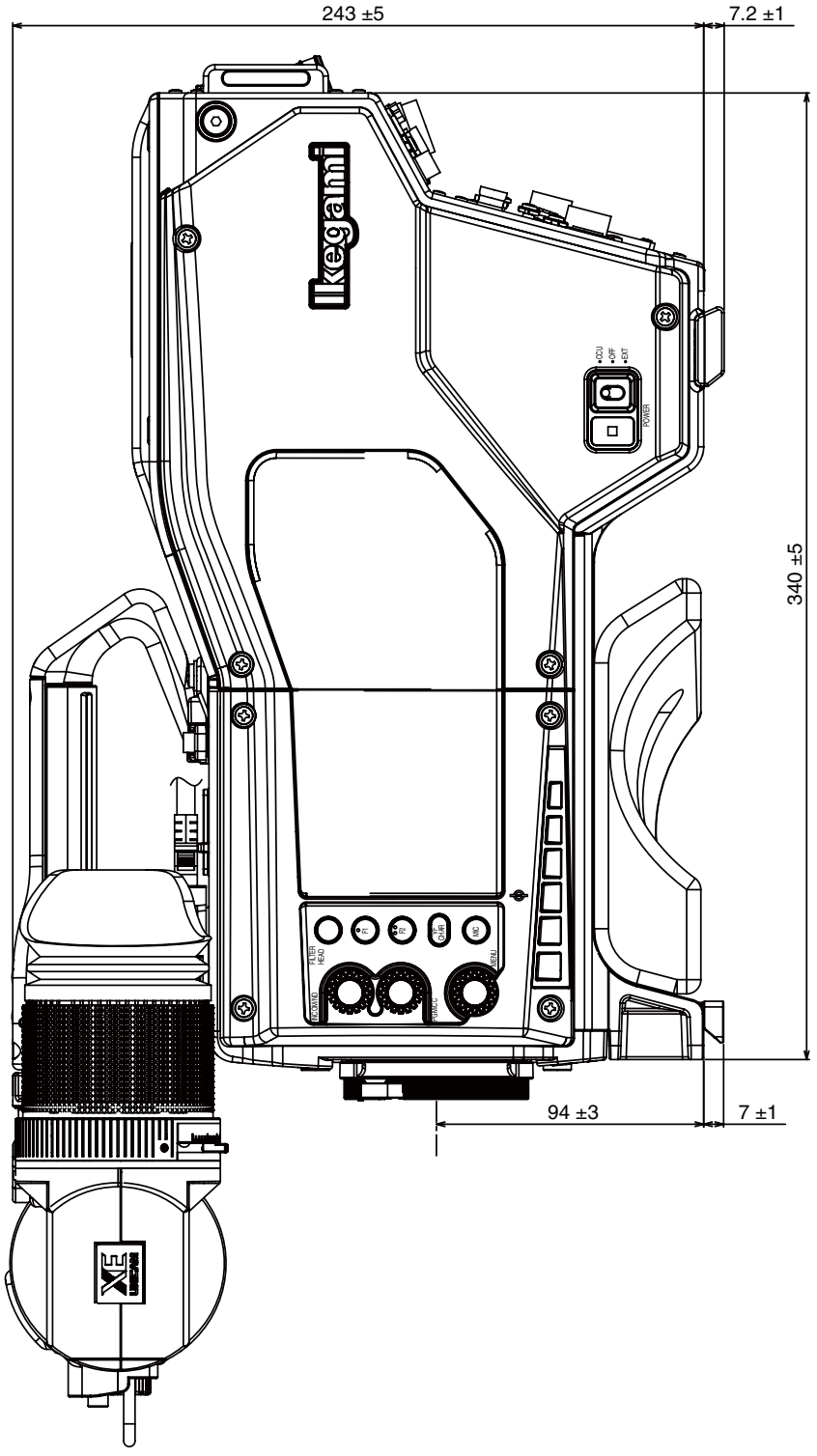
Performance

	Item	Rating	Remarks
1	S/N ratio	62dB (typ.)	HD 59.94i
2	Resolution	35% (typ.)	4K 59.94p
		60% (typ.)	HD
3	Limiting resolution	2000 TVL (typ.)	4K 59.94p
		1000 TVL (typ.)	HD
4	Power consumption	CAMERA : 55 W	
		CCU self operation : approx. up to 250 VA	
		Maximum CCU power consumption : approx. up to 710VA	Transmission capacity for single unit + CAMERA
		VFL201D :4 W	Color bar (1080i59.94) Heater OFF
		VFL701D :20 W max	Not including options.
		VFE741D :20 W max	Not including options.

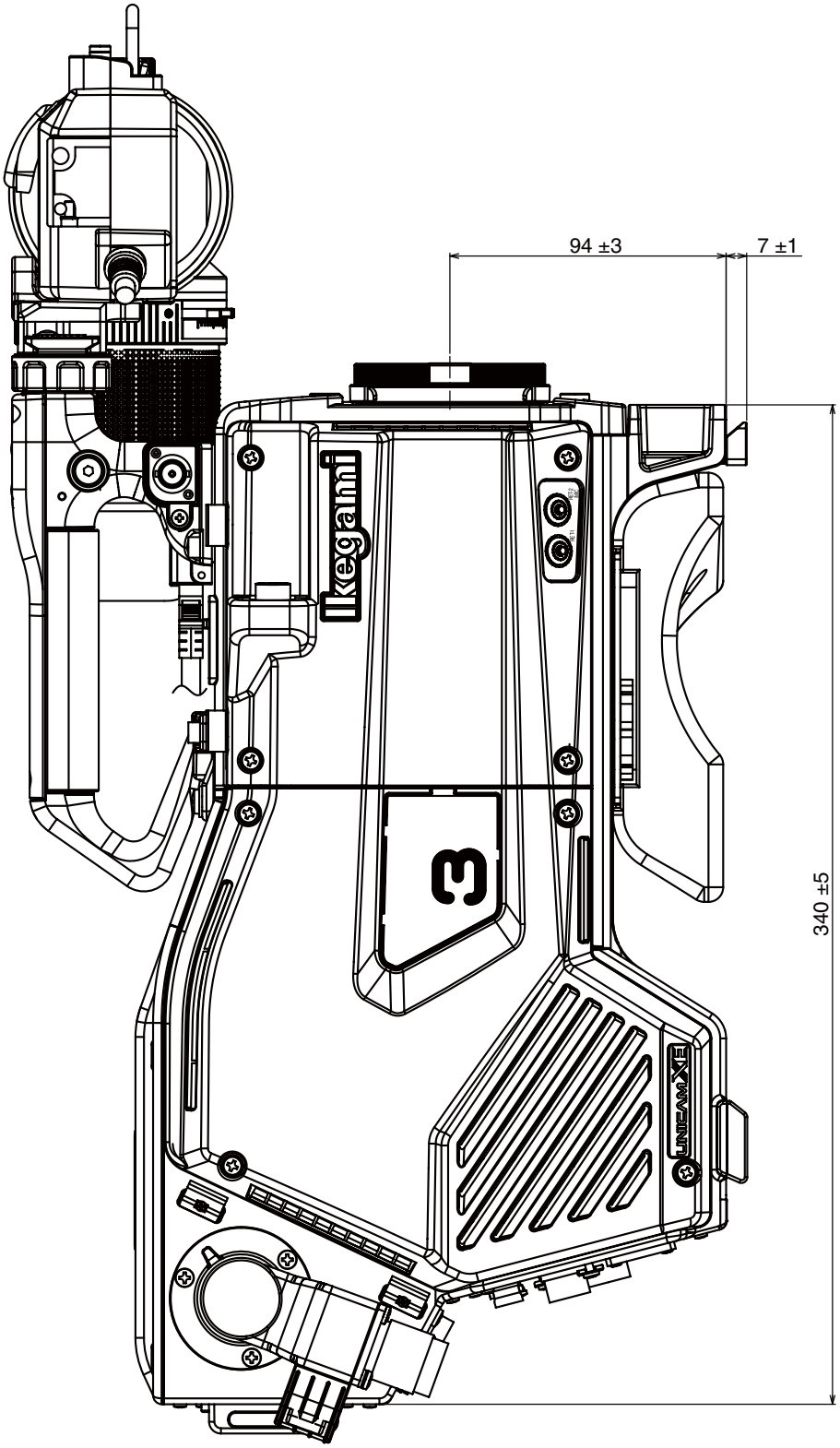
9.2 External Dimensions Diagram

CAMERA

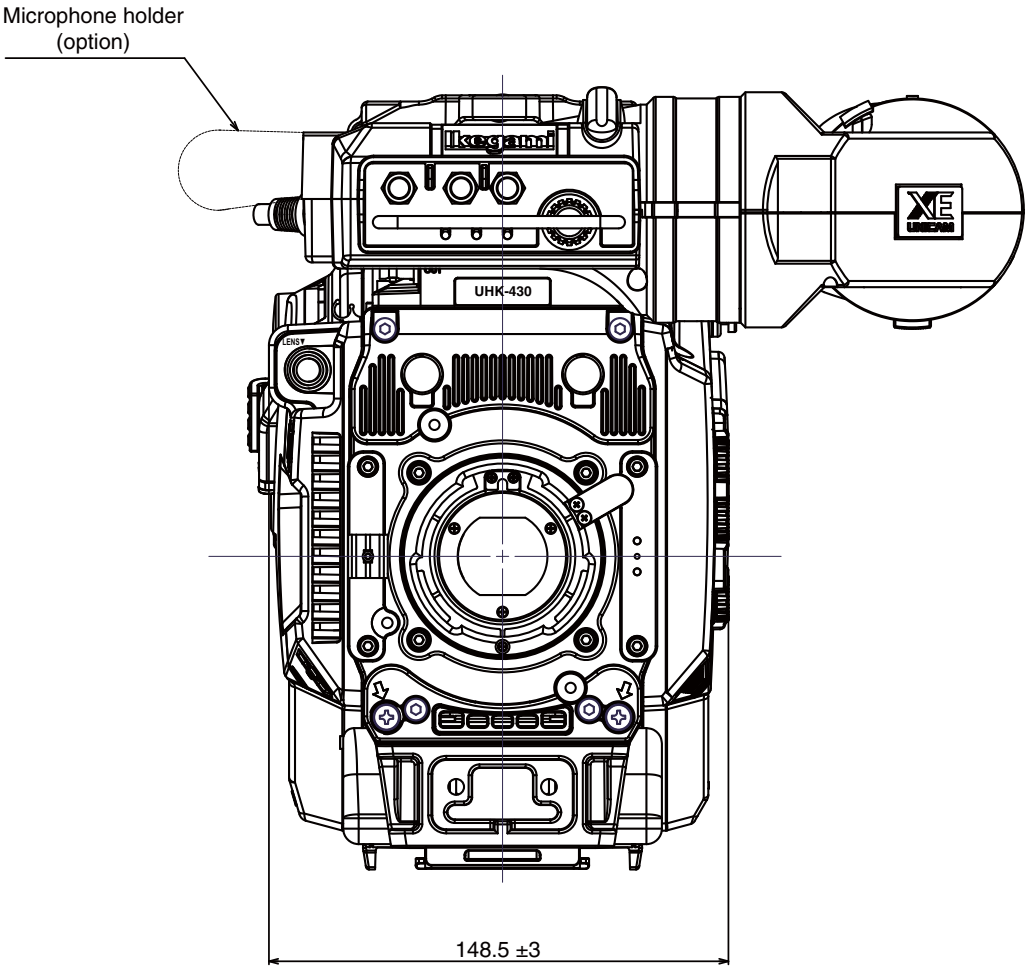
■ *Right Side View*



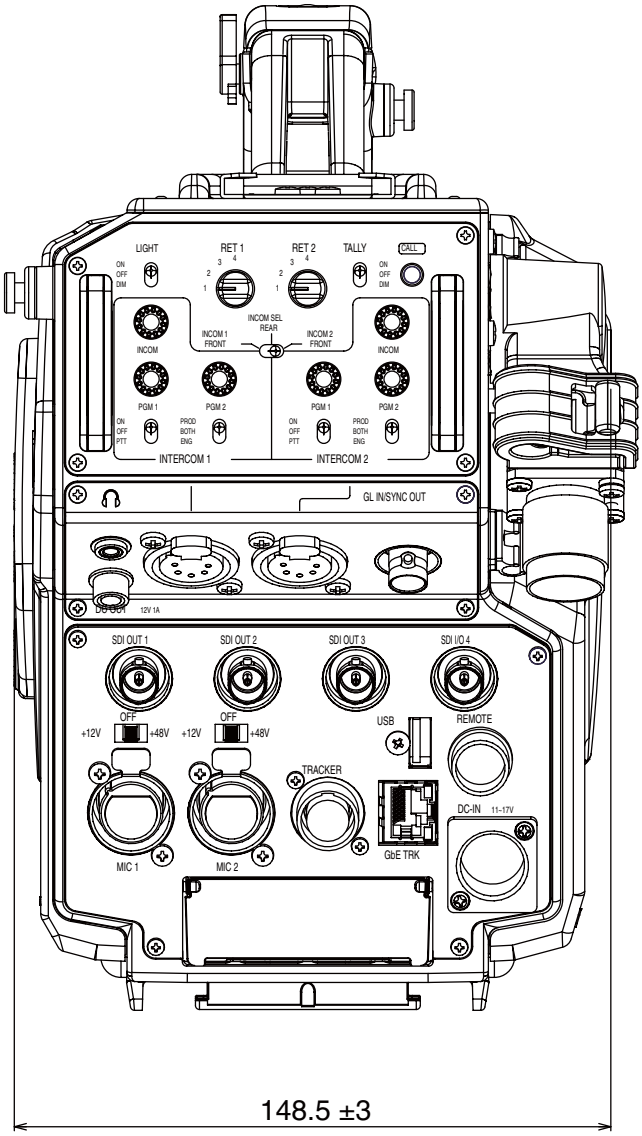
Left Side View



■ *Front Side View*

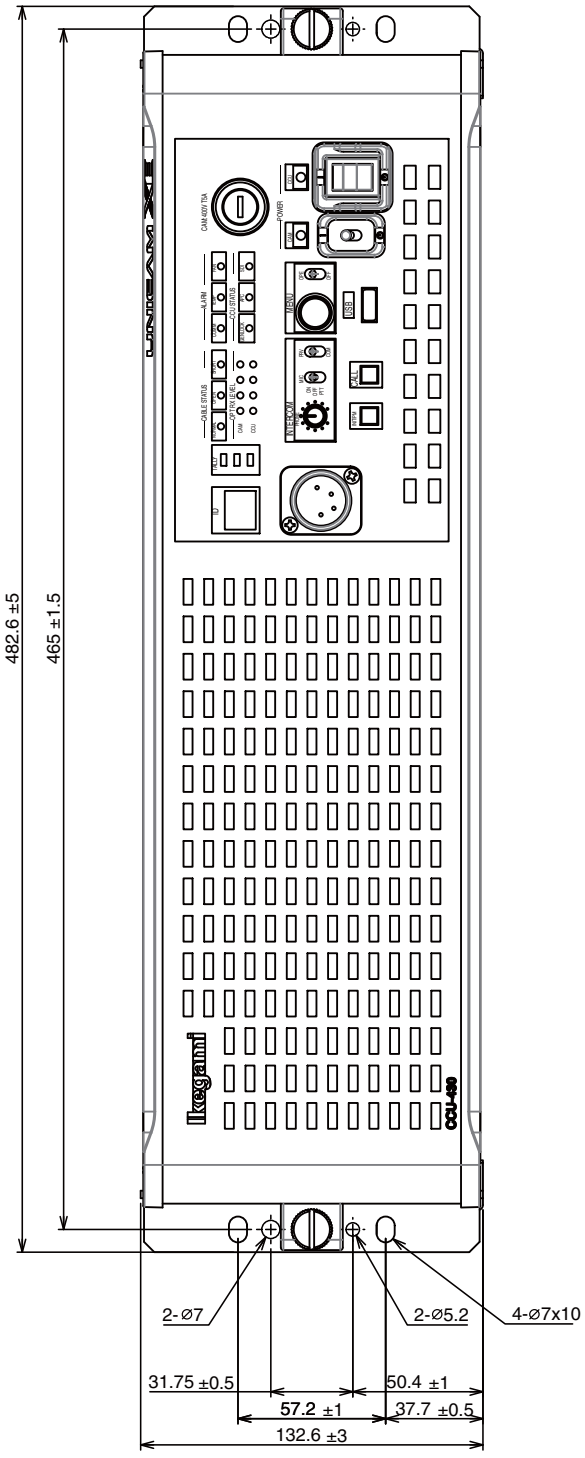


Rear Side View

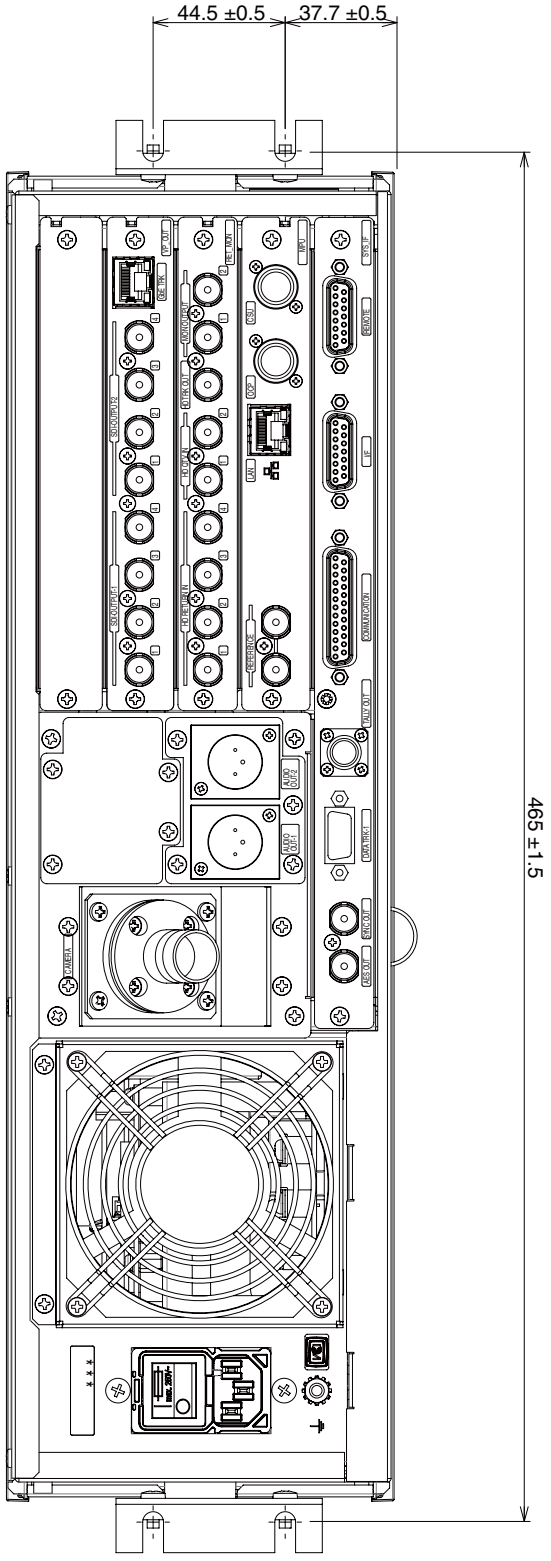


CCU

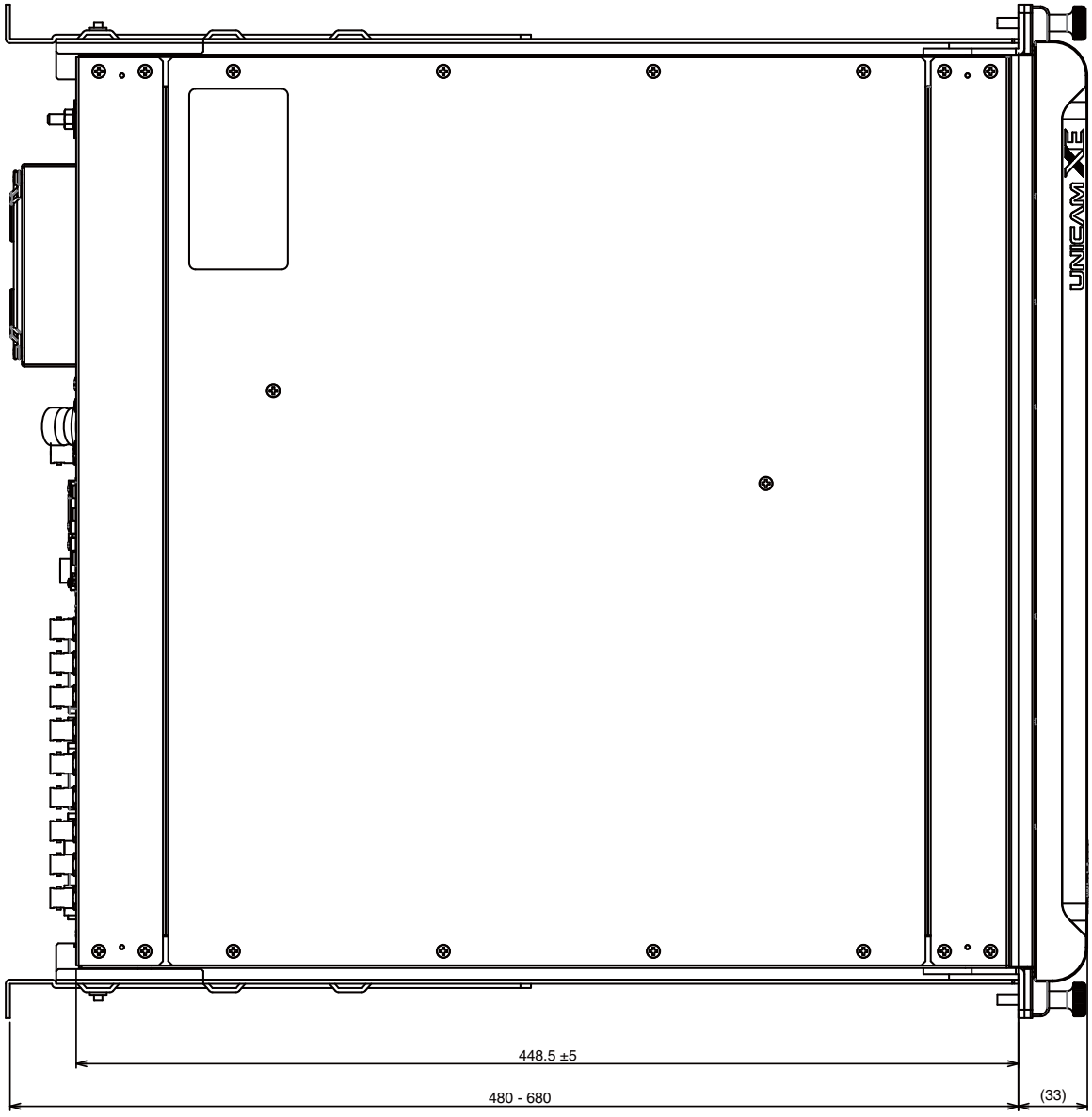
■ *Front Side View*



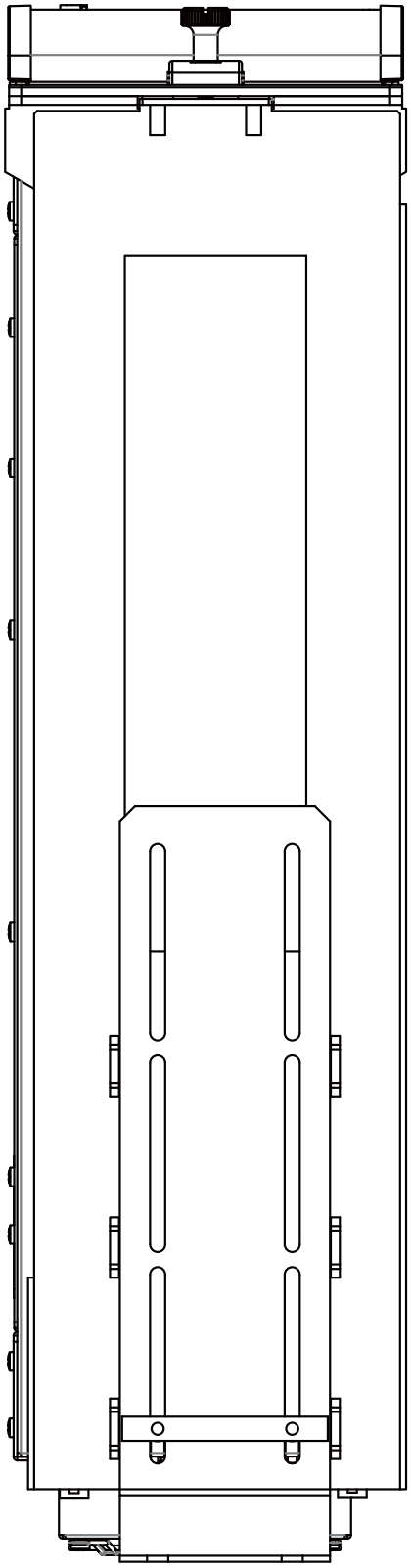
■ *Rear Side View*



■ *Top Side View*



■ *Side View*



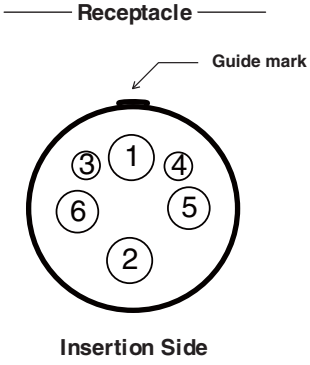
9.3 External Connections

Camera to its CCU (Fiber Cable) Connector

■ *CAMERA Connector*

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

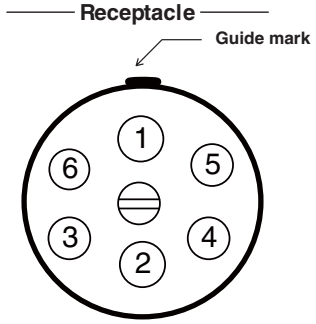
[Camera Side]
[SMPTE type]



Insertion Side

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

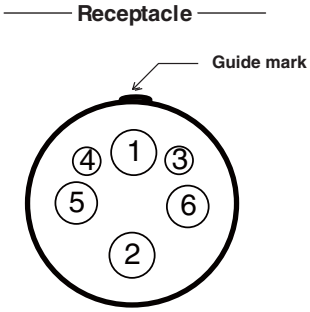
[OPS Series]



Insertion Side

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

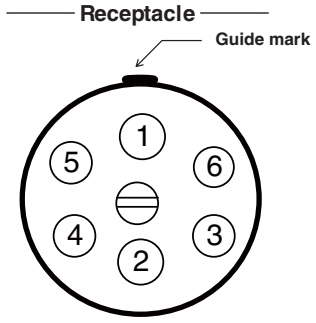
[CCU Side[
[SMPTE type]



Insertion Side

< SMPTE type >
Camera side : FXW. 3K. compatible product
Cable side : PUW. 3K.

[OPS Series]



Insertion Side

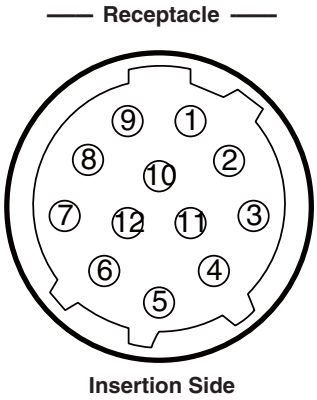
< OPS Series >
CCU side : OPS-PR
Cable side : OPS-J

Pin No.	Name	Function	I/O	External Interface
①	OPT H - C	Optical contact Camera -> CCU	OUT	
②	OPT C - 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	

Camera I/O Connector

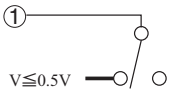
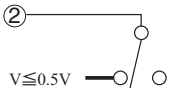
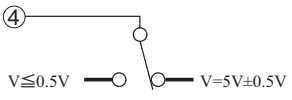
■ *Lens Connector*

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

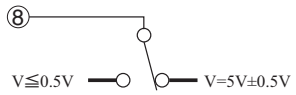
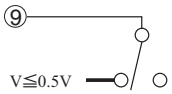


Camera side : HR10A-10R-12SC
Cable side : HR10A-10P-12PC (12-pin male plug)

[BTA Mount]

Pin No.	Name	Function	I/O	External Interface
①	RET ON	RETURN VIDEO ON/OFF signal RETURN ON: 0.5V or less Zout = 10M Ω or more RETURN OFF: OPEN Zout = 1.5k Ω or less Zin = 100k Ω ± 5% (10kΩ or more) Momentary operation	IN	
②	VTR TRIG	VTR START/STOP signal VTR START: 0.5V or less Zout = 10M Ω or more VTR STOP: OPEN Zout = 1.5k Ω or less Zin = 100k Ω ± 5% (10kΩ or more) Momentary operation	IN	
③	GND	Grounding for LENS	GND	
④	IRIS SERVO	Forced IRIS servo ON/OFF SERVO ON : +5V ± 0.5V Zout = 10k Ω or less SERVO OFF : 0.5V or less Zout = 1.5k Ω or less or 100k Ω or more	OUT	
⑤	IRIS CONT	Control output of lens iris F2.8 : 6.2V ± 0.05V (6.2V ± 0.1V) F16 : 3.4V ± 0.05V (3.4V ± 0.1V) CLOSE : 2.5V ± 0.2V (2.1V to 2.9V) Zout = 1k Ω ± 10% (Fixed)	OUT	
⑥	+12V LENS	DC+12V output for LENS Normal operation range: DC+10V - +20V (DC+10V - +17V)	OUT	
⑦	IRIS FOLLOW	Control output of lens iris F2.8 : 6.2V ± 0.05V (6.2V ± 0.1V) F 16 : 3.4V ± 0.05V (3.4V ± 0.1V) CLOSE : 2.5V ± 0.2V (2.1V to 2.9V) Zin = 100k Ω ± 2% (100k Ω or more)	IN	

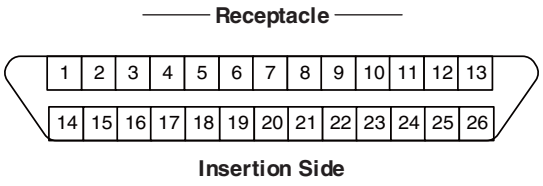
(continues to the next page)

Pin No.	Name	Function	I/O	External Interface
⑧	IRIS REM/AUTO	Switching between REMOTE/AUTO of IRIS REMOTE : +5V ± 0.5V Zout = 1k Ω ± 10% (10k Ω or less) AUTO : 0.5V or less Zout = 1.5k Ω or less or 100k Ω or more Zin = 100k Ω ± 2% (100k Ω or less)	OUT	
⑨	EXT ANS	Input/output of answer signals from the external system IN : +0.5V Ω or less Zout = 1.5k Ω or less OUT : OPEN Zout = 10M Ω or more Zin = 100k Ω ± 5% (10k Ω or more)	IN	
⑩	ZOOM FOLLOW	Control output of lens zoom WIDE : 2.0V ± 0.05V (2.0V ± 0.2V) TELE : 7.0V ± 0.05V (7.0V ± 0.2V) Zin = 100k Ω ± 2% (10k Ω or more) Zout = 1k Ω ± 10% (1k Ω or less)	IN	
⑪	SERIAL LENS→ CAMERA /FOCUS FOLLOW	Serial data reception (LENS → CAMERA) +0.5V CMOS level (VCC 5V ± 0.25V) Control output of lens focus Close end: 2.0V ± 0.05V (2.0V ± 0.2V) Infinite end: 7.0V ± 0.05V (7.0V ± 0.2V) Zin = 100k Ω ± 2% (20k Ω or more) Zout = 1k Ω ± 10% (1k Ω or less)	OUT	
⑫	SERIAL CAMERA→ LENS	Serial data transmission (CAMERA → LENS) +0.5V CMOS level (VCC 5V ± 0.25V)	OUT	

(The values indicated in ( ) are standard values in 2/3" Camera/Lens.
IN : Camera ← Lens
OUT : Camera → Lens

■ *VF Connector*

A connector used to connect the viewfinder.

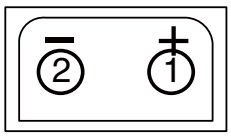


Camera side: HDR-EA26LMYPG1-SLE+
Cable side: HDR-EA26FAG1+

Pin No.	Name	Function	I/O	External Interface
①	GND	Ground for DC+12V power supply	GND	
⑭	GND	Ground for DC+12V power supply	GND	
②	GND	Ground for DC+12V power supply	GND	
⑮	GND	Ground for DC+12V power supply	GND	
③	+12V	DC +12V power supply	OUT	
⑯	+12V	DC +12V power supply	OUT	
④	+12V	DC +12V power supply	OUT	
⑰	+12V	DC +12V power supply	OUT	
⑤	RS422_RX+	Serial control signal (P) (VF -> Camera)	IN	
⑱	RS422_RX-	Serial control signal (N) (VF -> Camera)	IN	
⑥	SIGNAL_GND	Ground for Serial control signal (VF -> Camera)	GND	
⑲	IKEGAMI_VF	IKEGAMI VF connection control signal	IN	
⑦	RS422_TX+	Serial control signal (P) (Camera -> VF)	OUT	
⑳	RS422_TX-	Serial control signal (N) (Camera -> VF)	OUT	
⑧	SIGNAL_GND	Ground for Serial control signal (Camera -> VF)	GND	
㉑	NC	---	---	
⑨	NC	---	---	
㉒	R TALLY	R TALLY signal	OUT	
⑩	G TALLY	G TALLY signal	OUT	
㉓	Y TALLY	Y TALLY signal	OUT	
⑪	NC	---	OUT	
㉔	SIGNAL_GND	GND	GND	
⑫	SDI+	Serial video signal + (HD SDI)	OUT	
㉕	SDI-	Serial video signal - (HD SDI)	OUT	
⑬	SIGNAL_GND	GND	GND	
㉖	SHIELD GND	GND	GND	

■ *D-Tap Connector*

Supplies DC +12V (1.5A max) when an external compact monitor is used.

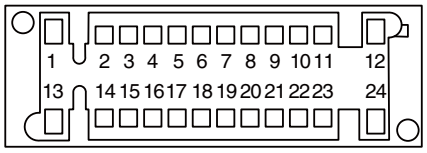


Camera side : D-Tap CN BASE
Cable side : D-Tap connector (male)

Pin No.	Name	Function	I/O	External Interface
①	+12V	DC +12V power supply	OUT	
②	+12V_RET	Ground for DC+12V power supply	GND	

■ *System extension (SE) connector*

Connect the system extender (SE) and camera.

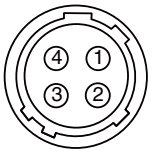


Camera side : QR/P4-24S-C(01)
SE side : QR/P4-24P-C(01)

Pin No.	Name	Function	I/O	External Interface
①	AC234V(H)	AC power supply (H) CAMERA -> SE	OUT	
②	SDI_N	Serial video signal –	OUT	
③	VF_RS422_TX_P	Serial control signal + Camera -> VF	OUT	
④	VF_RS422_TX_N	Serial control signal - Camera -> VF	OUT	
⑤	/LS_ON		IN	
⑥	/SE_INT		OUT	
⑦	SE_RS422_TX_P	Serial control signal + Camera -> SE	OUT	
⑧	SE_RS422_TX_N	Serial control signal - Camera -> SE	OUT	
⑨	IRIS_FOLLOW	Position information of lens iris	IN	
⑩	ZOOM_FOLLOW	Position information of lens zoom	IN	
⑪	S_LENS_STS		IN	
⑫	GND		GND	
⑬	AC234V(C)	AC power supply (C) CAMERA -> SE	OUT	
⑭	SDI_P	Serial video signal +	OUT	
⑮	VF_RS422_RX_P	Serial control signal + VF -> Camera	IN	
⑯	VF_RS422_RX_N	Serial control signal - VF -> Camera	IN	
⑰	STBY+3.3V_C		OUT	
⑱	/SE_ON		IN	
⑲	SE_RS422_RX_P	Serial control signal + SE -> Camera	IN	
⑳	SE_RS422_RX_N	Serial control signal - SE -> Camera	IN	
㉑	IRIS_CONT	Control signal of lens iris	IN	
㉒	FOCUS_FOLLOW	Position information of lens forcus	IN	
㉓	S_LENS_CNT		OUT	
㉔	GND		GND	

■ *DC OUT connector*

Outputs DC+12V (1A max) for general use.



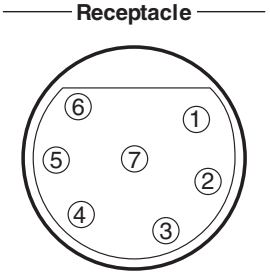
Camera side : HR10A-7R-4SC(73)
Cable side : HR10A-7P-4PC(73) or equivalent

Pin No.	Name	Function	I/O	External Interface
①	DC +12V_RET	Ground for DC+12V power supply	GND	
②	NC			
③	NC			
④	DC +12V	DC +12V power supply	OUT	

■ *INTERCOM Connector*

Used to connect an intercom headset.
Each headset type has each connector shape.
The both carbon and dynamic types can be used for the intercom microphone.
Please refer to Chapter 5 "INTERCOM/AUDIO" for switching between carbon and dynamic settings.

[7-pin type]

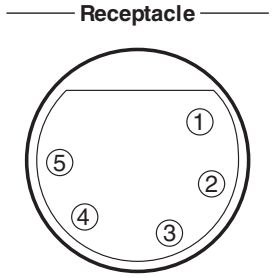


Insertion Side

Camera side : NC7FD-LX (NEUTRIK)
Cable side : XLR-7-12C

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

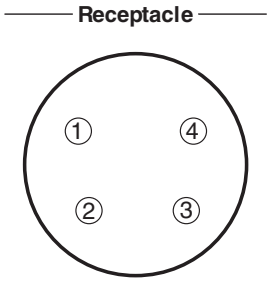
[5-pin type]



Camera head side : NC5FD-LX (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	TALK (H)	Intercom microphone input	IN	② Intercom microphone
③	SHIELD	Shield for LISTEN L / LISTEN R output	GND	③
④	LISTEN Lch (H)	LISTEN L output (H)	OUT	④ Receiver
⑤	PGM Rch (H)	PGM R output (H)	OUT	⑤ Receiver

[4-pin type]



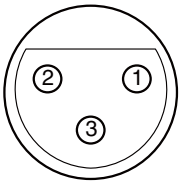
Camera head side : NC4FD-LX/NC4MD-LX (NEUTRIK)
Cable side : XLR-4-11C (4-pin male plug) or equivalent

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

■ *MIC-1 and MIC-2 Connector*

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

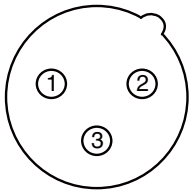
Camera main unit has female connector seats.



Insertion Side

Camera side : Plug receptacle HA16PRM-3SE (71)
Cable side : XLR-3-12C (3-pin male plug) or equivalent

Camera main unit has male connector seats.



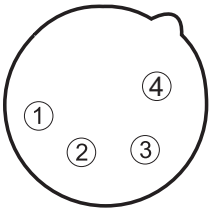
Insertion Side

Camera side : Receptacle HA16RM-3PE (76)
Cable side : XLR-3-11C (3-pin female 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	

■ *DC-IN Connector*

This connector is external power supply for camera.



Insertion Side

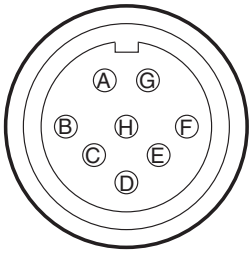
Camera side : XLR-4-32-F512
Cable side : XLR-4-11C (4-pin male plug) or equivalent

Pin No.	Name	Function	I/O	External Interface
①	+12 V RET	+12V input RET	GND	
②	NC	————————————	—	
③	NC	————————————	—	
④	+12 V IN	+12 V input (11V to 17V)	IN	

■ *REMOTE Connector*

Used to connect an external remote controller.

Receptacle



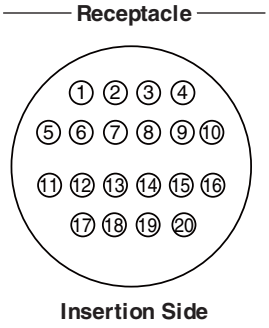
Insertion Side

Camera side : PRC05-R8F
Cable side : PRC05-PB8M

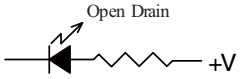
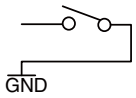
Pin No.	Name	Function	I/O	External Interface
Ⓐ	HED (+)	Digital data output (+) from camera to remote controller	OUT	
Ⓑ	HED (-)	Digital data output (-) from camera to remote controller	OUT	
Ⓒ	HEC (+)	Digital data input (+) from remote controller to camera	IN	
Ⓓ	HEC (-)	Digital data input (-) from remote controller to camera	IN	
Ⓔ	MU_REAR+12V	DC+12V power supply (max. 2.0A)	OUT	
Ⓕ	DGND	Ground for DC+12V power supply	OUT	
Ⓖ	RESERVE			
Ⓗ	RESERVE			

■ *TRACKER Connector*

TRACKER is a connector to make it easy to build a crane box and other external systems.



Camera side : HR10A-13R-20SB (73)
Cable side : HR10A-13P-20PC (73) or equivalent

Pin No.	Name	Function	I/O	External Interface
①	PC_TXD_P	CRANE / TRNUK DATA OUT	OUT	RS422 (P) *1
②	PC_TXD_N	CRANE / TRNUK DATA OUT	OUT	RS422 (N) *1
③	PC_RXD_P	CRANE / TRNUK DATA IN	IN	RS422 (P) *1
④	PC_RXD_N	CRANE / TRNUK DATA IN	IN	RS422 (N) *1
⑤	GND	Ground for DC+12V power supply, common GND		GND for MU_REAR+12V
⑥	MU_REAR+12V	DC +12V power supply (Max : 1.5A)		DC+12V (When the DC - IN connector is powered, its input voltage is output)
⑦	R_TALLY	R TALLY output	OUT	Open Drain 
⑧	G_TALLY	G TALLY output	OUT	
⑨	RET-1	RET-1 SW IN	IN	
⑩	RET-2	RET-2 SW IN	IN	
⑪	INC_MIC_ON	PTT signal of the TRACKER MIC (Lo : ON, Hi-Z : OFF)	IN	
⑫	TRACKER_EN	Select the connector mode (L : CRANE mode, Hi-z : TRUNK DATA mode)	IN	
⑬	RESERVE	Reserve	IN	
⑭	RESERVE	Reserve	IN	
⑮	TRACKER-1	INTERCOM-1 (Receive Audio)	OUT	Unbalance Audio 0dBu / -20dBu
⑯	TRACKER-2	INTERCOM-2 (Receive Audio)	OUT	
⑰	TRACKER-3	INTERCOM-3 (Receive Audio)	OUT	
⑱	TRACKER-4	INTERCOM-4 (Receive Audio)	OUT	
⑲	T_TALK_H	INTERCOM-MIC (H) (Talk Audio)	IN	High impedance balanced 0dBu / -20dBu
⑳	T_TALK_C	INTERCOM-MIC (C) (Talk Audio)	IN	

Caution:

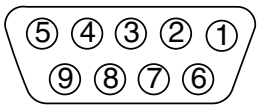
*1: DATA TRUNK and CRANE lines uses Pins 1 to 4 exclusively.

CCU I/O Connector

■ *DATA TRUNK Connector*

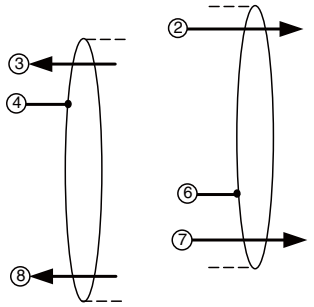
Communicates between the camera and the system by RS-422 via CCU.

Receptacle



Insertion Side

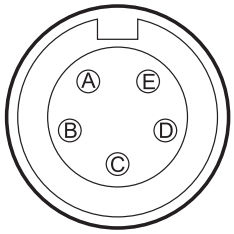
CCU side : DELC-J9SAF-20L9E
Cable side : DE-9P-RR or equivalent (9pin male plug screw #4-40UNC)

Pin No.	Name	Function	I/O	External Interface
①	N.C			
②	TR1 OUT (N)	Digital Data Output (N)	OUT	
③	TR1 IN (P)	Digital Data Input (P)	IN	
④	IN (S)	Input Shield		
⑤	N.C			
⑥	OUT (S)	Output Shield		
⑦	TR1 OUT (P)	Digital Data Output (P)	OUT	
⑧	TR1 IN (N)	Digital Data Input (N)	IN	
⑨	GND	GND		

■ *TALLY OUT Connector*

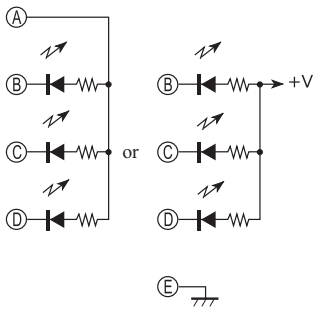
Used to send TALLY control signal.

Receptacle



Insertion Side

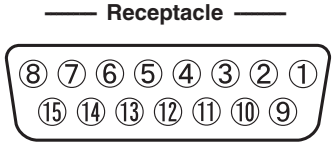
CCU side : PRC05-RB5F1
Cable side : PRC 05-P5M or equivalent

Pin No.	Name	Function	I/O	External Interface
Ⓐ	DC +12 V OUT	DC +12V power output	OUT	
Ⓑ	R TALLY	Red Tally output (ON: GND)	OUT	
Ⓒ	Y TALLY/COM TALLY	Yellow Tally output or COMMON TALLY output (ON: GND)	OUT	
Ⓓ	G TALLY	Green TALLY output (ON: GND)	OUT	
Ⓔ	TALLY GND	Ground for TALLY signal	GND	

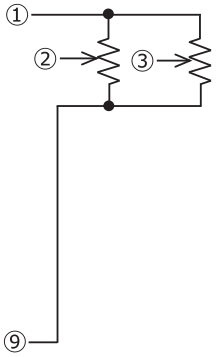
- Select one from Y TALLY output or COMMON TALLY output for the pin C. It can be set from the CCU menu. Use of COMMON TALLY OUT enables to control both R TALLY and G TALLY simultaneously.

■ *REMOTE Connector*

This is a connector used to externally control the microphone gain of the camera.
The hex jack screw for the Japanese domestic models is 2.6 mm, and the hex jack screw for oversea models are #4-40UNC as the standard specifications.



CCU side : [metric] 17LE-13150-27(D3AB)-FA
[inch] 17LE-13150-27(D3CB)-FA
Cable side : DA-15PF-N or equivalent

Pin No.	Name	Function	I/O	External Interface
①	+5.5V	DC + 5.5V output	OUT	
②	MIC1_FINE_CTL	MIC1 GAIN control voltage input 0 to 5.5V	IN	
③	MIC2_FINE_CTL	MIC2 GAIN control voltage input 0 to 5.5V	IN	
④	NC			
⑤	MIC1 GAIN STEP2	MIC1 GAIN STEP2 *1	IN	
⑥	MIC1 GAIN STEP1	MIC1 GAIN STEP1 *1	IN	
⑦	MIC1 GAIN STEP0	MIC1 GAIN STEP0 *1	IN	
⑧	MIC1_REM_CTRL	MIC1 GAIN CONTROL ENABLE *2		
⑨	GND	GND	IN	
⑩	NC			
⑪	NC			
⑫	MIC2 GAIN STEP2	MIC2 GAIN STEP2 *1	IN	
⑬	MIC2 GAIN STEP1	MIC2 GAIN STEP1 *1	IN	
⑭	MIC2 GAIN STEP0	MIC2 GAIN STEP0 *1	IN	
⑮	MIC2_REM_CTRL	MIC2 GAIN CONTROL ENABLE *2	IN	

*1 MIC GAIN STEP CONTROL

GAIN STEP2	GAIN STEP1	GAIN STEP0	GAIN
H	H	H	-60 dB
H	H	L	-50 dB
H	L	H	-40 dB
H	L	L	-30 dB
L	H	H	-20 dB
L	H	L	-10 dB
L	L	H	0 dB
L	L	L	+4 dB

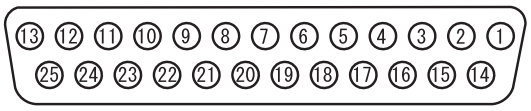
*2 MIC GAIN EXTERNAL REMOTE CONTROL

MIC1 REM_CTRL	MIC2 REM_CTRL	MIC GAIN CTRL
L	L	MIC 1 and 2 ON
L	H	MIC 1 ON
H	L	MIC 2 ON
H	H	INTERNAL

■ *COMMUNICATION Connector*

This is the connector that connects the control inputs from the external INTERCOM system, program voice, and external TALLY system.
The hex jack screw for the Japanese domestic models is 2.6 mm, and the hex jack screw for oversea models are #4-40UNC as the standard specifications.

—— Receptacle ——



Insertion Side

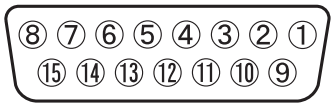
CCU side : [metric] 17LE-13250-27(D3AB)-FA
[inch] 17LE-13250-27(D3CB)-FA
Cable side : DB-25PF-N or equivalent

Pin No.	Name	Function	I/O	External Interface
				4 WIRE / RTS / Clear-Com
①	ENG C-S(H)	ENG CH Intercom output (H) to the system from the CCU	OUT	1
②	ENG C-S(C)	ENG CH Intercom output (C) to the system from the CCU	OUT	2
③	ENG(S)	ENG CH Intercom Shield		3
④	ENG S-C(H)	ENG CH Intercom input (H) to the CCU from the system	IN	4
⑤	ENG S-C(C)	ENG CH Intercom input (C) to the CCU from the system	IN	5
⑥	PGM-1(H)	Program Audio Channel-1 input (H)	IN	6
⑦	PGM-1(C)	Program Audio Channel-1 input (C)	IN	7
⑧	PGM-1(S)	Program Audio Channel-1 Shield		8
⑨	GND	Ground	GND	9
⑩	Y TALLY IN	Yellow Tally Input (+)	IN	10 MAKE
⑪	R TALLY IN	Red Tally Input (+)	IN	11 MAKE
⑫	R TALLY COMM	Red Tally Common		12
⑬	GND	Ground	GND	13
⑭	PROD C-S(H)	PROD CH Intercom output (H) to the system from the CCU	OUT	14
⑮	PROD C-S(C)	PROD CH Intercom output (C) to the system from the CCU	OUT	15
⑯	PROD(S)	PROD CH Intercom Shield		16
⑰	PROD S-C(H)	PROD CH Intercom input (H) to the CCU from the system	IN	17
⑱	PROD S-C(C)	PROD CH Intercom input (C) to the CCU from the system	IN	18
⑲	PGM-2(H)	Program Audio Channel-2 input (H)	IN	19
⑳	PGM-2(C)	Program Audio Channel-2 input (C)	IN	20
㉑	PGM-2(S)	Program Audio Channel-2 Shield		21
㉒	PGM-3(H)	Program Audio Channel-3 input (H)	IN	22
㉓	PGM-3(C)	Program Audio Channel-3 input (C)	IN	23
㉔	G TALLY IN	Green Tally Input (+)	IN	24 MAKE
㉕	G TALLY COMM	Green Tally Common		25

I/F Connector

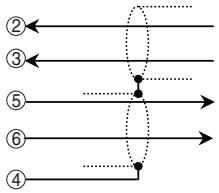
The serial communication standard RS-422 DATA TRUNK #2, Intercom external control, and preview switch contact are assigned.

—— Receptacle ——



Insertion Side

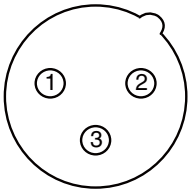
CCU side : **[metric] 17LE-13150-27(D3AB)-FA**
[inch] 17LE-13150-27(D3CB)-FA
Cable side : **DA-15PF-N** or equivalent

Pin No.	Name	Function	I/O	External Interface
①	NC		—	
②	TR2 IN (P)	DATA TRUNK ch2 (P) (System ---> CCU ---> CAMERA)	IN	
③	TR2 IN (N)	DATA TRUNK ch2 (N) (System ---> CCU ---> CAMERA)	IN	
④	TR2 (S)	DATA TRUNK ch2 Shield		
⑤	TR2 OUT (P)	DATA TRUNK ch2 (P) (CAMERA ---> CCU ---> System)	OUT	
⑥	TR2 OUT (N)	DATA TRUNK ch2 (N) (CAMERA ---> CCU ---> System)	OUT	
⑦	NC		—	
⑧	HP IND	CAMERA POWER ON INDICATOR	OUT	
⑨	GND		GND	
⑩	DC +12V OUT	DC +12V power output	OUT	
⑪	PREVIEW SW	Preview switch	OUT	
⑫	PREVIEW COM	Preview switch common	OUT	
⑬	NC		—	
⑭	NC		—	
⑮	NC		—	

■ *AUDIO Connector*

Used to connect for audio output. (600Ω balanced output)

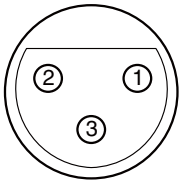
Camera main unit has male connector seats.



Insertion Side

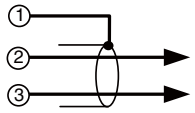
CCU side : Plug receptacle HA16RD-3P (76)
Cable side : XLR-3-11C (3-pin female plug) or equivalent

Camera main unit has female connector seats.



Insertion Side

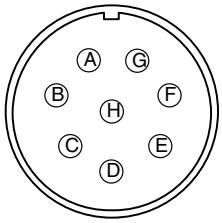
Camera side : Receptacle HA16PRK-3S
Cable side : XLR-3-12C (3-pin male plug) or equivalent

Pin No.	Name	Function	I/O	External Interface
①	SHIELD	Audio line shield	GND	
②	AUDIO (HOT)	AUDIO LINE HOT	IN	
③	AUDIO (COLD)	AUDIO LINE COLD	IN	

■ *OCP CSU Connector*

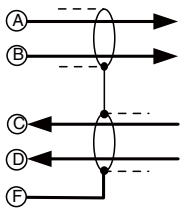
Used to connect each type of control panel.

Receptacle



Insertion Side

CCU side : PRC05-RB8F1
Cable side : PRC05-PB8M or equivalent

Pin No.	Name	Function	I/O	External Interface
Ⓐ	HED(+)	Digital data output (+) from CCU to control panel	OUT	
Ⓑ	HED(-)	Digital data output (–) from CCU to control panel	OUT	
Ⓒ	HEC(+)	Digital data output (+) from control panel to CCU	IN	
Ⓓ	HEC(-)	Digital data output (–) from control panel to CCU	IN	
Ⓔ	+12V	DC+12V power supply to control panel	OUT	
Ⓕ	+12V_RET	Ground for DC+12V power supply	GND	
Ⓖ	NC			
Ⓗ	NC			

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.

UHK-430/CCU-430

4K/HD
Portable Camera System

OPERATION MANUAL

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