

# Panasonic®

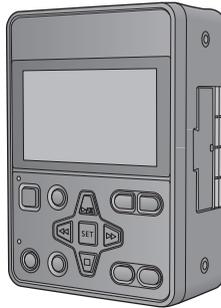
## Operating Instructions

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### Memory Card Portable Recorder

Model No. **AG-UMR20P**  
**AG-UMR20E**

**POV CAM**



Please read these instructions carefully before using this product, and save this manual for future use.

**AVCHD™**  
Progressive

**HDMI™**

**SX™**

**DOLBY AUDIO™**

**PJ EJ**

W0517SQ1069 -FJ

**ENGLISH**

DVQP1321YA

<b>Български</b>	Посетете следния уебсайт относно информация за безопасността и важни уведомления за продукта.
<b>Hrvatski</b>	Za sigurnosne informacije i važne obavijesti o proizvodu posjetite sljedeću internetsku stranicu.
<b>Čeština</b>	Na následujícím webu najdete bezpečnostní informace a důležité poznámky k tomuto produktu.
<b>Dansk</b>	Besøg følgende webside for sikkerhedsinformation og vigtige bemærkninger vedrørende produktet.
<b>Nederlands</b>	Ga naar de volgende website voor veiligheidsinformatie en belangrijke meldingen over het product.
<b>Eesti</b>	Toodet puudutava ohutusteabe ja oluliste märkuste saamiseks külastage järgmist veebilehte.
<b>Suomi</b>	Käy seuraavalla verkkosivulla saadaksesi turvallisuustietoja ja tärkeitä tietoja liittyen laitteeseen.
<b>Ελληνικά</b>	Για πληροφορίες σχετικά με θέματα ασφάλειας και σημαντικές ειδοποιήσεις που αφορούν το προϊόν σας, επισκεφτείτε τον ιστότοπο που ακολουθεί.
<b>Magyar</b>	A termékkel kapcsolatos biztonsági információkért és fontos értesítésekért látogasson el az alábbi weboldalra.
<b>Latviešu</b>	Lai iegūtu informāciju par drošību un skatītu svarīgus paziņojumus par šo produktu, apmeklējiet tālāk norādīto tīmekļa vietni.
<b>Lietuvių</b>	Jei reikia saugos informacijos ir svarbių pranešimų apie gaminį, apsilankykite toliau nurodytoje svetainėje.
<b>Polski</b>	Informacje o bezpieczeństwie i ważne informacje o produkcie znajdując się w poniższej witrynie internetowej.
<b>Português</b>	Consulte o seguinte website para as informações de segurança e importantes notificações sobre o produto.
<b>Română</b>	Vizitați următoarea pagină web pentru informații de securitate și notificări importante cu privire la produs.
<b>Slovensky</b>	Pre bezpečnostné informácie a dôležité oznámenia súvisiace s produktom navštívte túto webovú stránku.
<b>Slovenščina</b>	Za varnostne informacije in pomembna obvestila v zvezi z izdelkom obiščite naslednje spletno mesto.
<b>Svenska</b>	Besök följande webbplats för säkerhetsinformation och viktiga meddelanden om produkten.

<https://pro-av.panasonic.net/manual/en/index.html>

# Information for Your Safety

## WARNING:

To reduce the risk of fire, electric shock or product damage,

- Do not expose this unit to rain, moisture, dripping or splashing.
- Do not place objects filled with liquids, such as vases, on this unit.
- Use only the recommended accessories.
- Do not remove covers.
- Do not repair this unit by yourself. Refer servicing to qualified service personnel.

## CAUTION!

To reduce the risk of fire, electric shock or product damage,

- Do not install or place this unit in a bookcase, built-in cabinet or in another confined space. Ensure this unit is well ventilated.
- Do not obstruct this unit's ventilation openings with newspapers, tablecloths, curtains, and similar items.
- Do not place sources of naked flames, such as lighted candles, on this unit.

## CAUTION:

### About using a headphone

- Excessive sound pressure from earphones and headphones can cause hearing loss.
- Listening at full volume for long periods may damage the user's ears.

## CAUTION:

**Do not leave the unit in direct contact with the skin when in use.**

- Low temperature burns may result if the skin is left in direct contact with the high temperature parts of the unit or heated air from the ventilation openings of the unit.

## CAUTION:

### About using SD Card

- Keep the Memory Card out of reach of children to prevent swallowing.

 indicates safety information.

## ■ Product identification marking

Product	Location
Memory Card Portable Recorder	Bottom
AC adaptor	Bottom

This unit is intended for use in moderate and tropical climates. (Southeast Asia, Middle East only)

This unit is intended for use in moderate climates. (Except Southeast Asia, Middle East)

**FCC NOTICE (USA)**

**Declaration of Conformity**

Model Number: AG-UMR20P  
Trade Name: Panasonic  
Responsible Party: Panasonic Corporation of North America  
Two Riverfront Plaza Newark NJ07102  
Support contact: 1-800-524-1448

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

To assure continued compliance, follow the attached installation instructions and do not make any unauthorized modifications.

**CAUTION:**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The user may find the booklet "Something About Interference" available from FCC local regional offices helpful.

**FCC Warning:**

To assure continued FCC emission limit compliance, follow the attached installation instructions and the user must use only shielded interface cables when connecting to host computer or peripheral devices. Also, any unauthorized changes or modifications to this equipment could void the user's authority to operate this device.

**NOTIFICATION (Canada)**

CAN ICES-3(B)/NMB-3(B)

 indicates safety information.

<For U.S.A. only>



**<For the U.S.A. and Canada only>**

## **AC adaptor**

This AC adaptor operates on AC between 100 V and 240 V.

But

- In the U.S.A. and Canada, the AC adaptor must be connected to a 120 V AC power supply only.
- When connecting to an AC supply outside of the U.S.A. or Canada, use a plug adaptor to suit the AC outlet configuration.
- When connecting to a supply of greater than AC 125 V, ensure the cord you use is suited to the voltage of the AC supply and the rated current of the AC adaptor.
- Contact an electrical parts distributor for assistance in selecting a suitable AC plug adaptor or AC cord set.

The power plug is the disconnecting device. Install this unit so that the power plug can be unplugged from the socket outlet immediately.

- The unit is in the standby condition when the AC adaptor is connected. The primary circuit is always "live" as long as the AC adaptor is connected to an electrical outlet.
- Do not use any other AC adaptors except the supplied one.

**<For other countries or regions>**

The mains plug is the disconnecting device. Install this unit so that the mains plug can be unplugged from the socket outlet immediately.

**<For the U.S.A. and Canada only>**

Conforms to UL STD 60065.

Certified to CAN/CSA STD C22.2 No.60065.

**<For Europe only>**

### **■ EMC Electric and magnetic compatibility**

This symbol (CE) is located on the rating plate.

### **■ Concerning the battery**

## **CAUTION**

- Danger of explosion if battery is incorrectly replaced. Replace only with the type recommended by the manufacturer.
- When disposing of the batteries, please contact your local authorities or dealer and ask for the correct method of disposal.

## **Warning**

Risk of fire, explosion and burns. Do not disassemble, heat above 60 °C (140 °F) or incinerate.

- We recommend using Panasonic batteries (VW-VBD58/AG-VBR59/AG-VBR89/AG-VBR118).
- If you use other batteries, we cannot guarantee the quality of this product.
- Do not heat or expose to flame.
- Do not leave the battery(ies) in a car exposed to direct sunlight for a long period of time with doors and windows closed.

### **Battery pack (Lithium ion battery pack)**

- Use the specified unit to recharge the battery pack.
- Do not use the battery pack with equipment other than the specified unit.
- Do not get dirt, sand, liquids, or other foreign matter on the terminals.
- Do not touch the plug terminals (+ and -) with metal objects.
- Do not disassemble, remodel, heat or throw into fire.

If any electrolyte should come into contact with your hands or clothes, wash it off thoroughly with water.

If any electrolyte should come into contact with your eyes, never rub the eyes. Rinse eyes thoroughly with water, and then consult a doctor.

## **■ IMPORTANT SAFETY INSTRUCTIONS**

Read these operating instructions carefully before using the unit. Follow the safety instructions on the unit and the applicable safety instructions listed below. Keep these operating instructions handy for future reference.

- 1) Read these instructions.
- 2) Keep these instructions.
- 3) Heed all warnings.
- 4) Follow all instructions.
- 5) Do not use this apparatus near water.
- 6) Clean only with dry cloth.
- 7) Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- 8) Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- 9) Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- 10) Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- 11) Only use attachments/accessories specified by the manufacturer.
- 12) Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
- 13) Unplug this apparatus during lightning storms or when unused for long periods of time.
- 14) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.



## For the AC mains plug of three pins

### ■ Caution for AC mains lead

For your safety, please read the following text carefully.

This appliance is supplied with a moulded three pin mains plug for your safety and convenience. A 5-ampere fuse is fitted in this plug.

Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5-ampere and that it is approved by ASTA or BSI to BS1362.

Check for the ASTA mark  or the BSI mark  on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.

If you lose the fuse cover the plug must not be used until a replacement cover is obtained.

A replacement fuse cover can be purchased from your local dealer.

### Before use

Remove the connector cover.

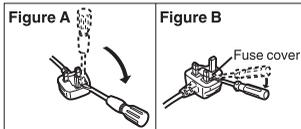
### How to replace the fuse

The location of the fuse differ according to the type of AC mains plug (figures A and B).

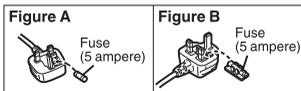
Confirm the AC mains plug fitted and follow the instructions below.

Illustrations may differ from actual AC mains plug.

1. Open the fuse cover with a screwdriver.



2. Replace the fuse and close or attach the fuse cover.



### <For USA only>

Disposal may be regulated in your community due to environmental considerations. For disposal or recycling information, please visit Panasonic website: <http://www.panasonic.com/environmental> or call 1-888-769-0149.

### <For Europe only>

### ■ Disposal of Old Equipment and Batteries

#### Only for European Union and countries with recycling systems



These symbols on the products, packaging, and/or accompanying documents mean that used electrical and electronic products and batteries must not be mixed with general household waste.

For proper treatment, recovery and recycling of old products and used batteries, please take them

to applicable collection points in accordance with your national legislation.

By disposing of them correctly, you will help to save valuable resources and prevent any potential negative effects on human health and the environment.

For more information about collection and recycling, please contact your local municipality, dealer or supplier.

Penalties may be applicable for incorrect disposal of this waste, in accordance with national legislation.



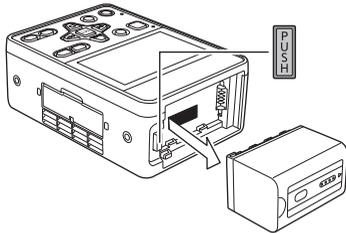
#### Note for the battery symbol (bottom symbol):

This symbol might be used in combination with a chemical symbol. In this case it complies with the requirement set by the Directive for the chemical involved.

## To remove the battery

### Main Power Battery (Lithium ion Battery)

While pressing the battery release button, remove the battery.



### Back-up Battery (Lithium Battery)

- For the removal of the battery for disposal at the end of its service life, please consult your dealer.

AEEE Yönetmeliğine Uygundur.  
AEEE Complies with Directive of Turkey.

## Note regarding the Power Management function specified under COMMISSION REGULATION (EC) No 1275/2008 implementing Directive 2009/125/EC of the European Parliament and of the Council.

This device is designed and manufactured for use at a broadcasting station and/or in a similar environment. This device is not equipped with a Power Management function or the Power Management function is set to OFF as it will prevent the device from fulfilling its intended purpose for the reasons below.

- If the device is a Studio Camera, a Weather Camera, a Mixer or other processor:  
A Power Management function may cause the device to suddenly stop during recording or while On Air.
- If the device is a Studio Monitor:  
A Power Management function may cause video for the confirmation of whether a signal is normal, or whether the signal has been lost, to be un-viewable.
- If the device is a Camera Recorder:  
A professional camera recorder must be able to start quickly at any time, but a Power Management function will cause an increase in the time taken to resume from Stand-by mode.

## Інформація для покупця

Виробник:	Panasonic Corporation	Панасонік Корпорейшн
Адреса виробника:	Kadoma, Osaka, Japan	Кадома, Осака, Японія
Країна походження:	China	Китай

Імпортер:	ТОВ "ПАНАСОНІК УКРАЇНА ЛТД"
Адреса імпортера:	провулок Охтирський, будинок 7, місто Київ, 03022, Україна

### Примітки:

Термін служби виробу	7 років
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Дата виготовлення може бути визначена за допомогою комбінації літер та цифр серійного номера, розташованого на продукті.

Приклад: X X XXXXXXX

Рік: остання цифра року (7 – 2017, 8 – 2018,...0 – 2020)

Місяць: А – Січень, В – Лютий... L – Грудень

Manufactured by: Panasonic Corporation, Osaka, Japan  
Importer's name and address of pursuant to EU rules:  
Panasonic Marketing Europe GmbH  
Panasonic Testing Centre  
Winsbergring 15, 22525 Hamburg, Germany

## ■ Cautions for use

### About this unit

The unit and the SD card become warm during use. This is not a malfunction.

**Keep this unit as far away as possible from electromagnetic equipment (such as microwave ovens, TVs, video games etc.).**

- If you use this unit on top of or near a TV, the pictures and/or sound on this unit may be disrupted by electromagnetic wave radiation.
- Do not use this unit near cell phones because doing so may result in noise adversely affecting the pictures and/or sound.
- Recorded data may be damaged, or pictures may be distorted, by strong magnetic fields created by speakers or large motors.
- Electromagnetic wave radiation generated by microprocessors may adversely affect this unit, disturbing the pictures and/or sound.
- If this unit is adversely affected by electromagnetic equipment and stops functioning properly, turn this unit off and remove the battery or disconnect AC adaptor. Then reinsert the battery or reconnect AC adaptor and turn this unit on.

**Do not use this unit near radio transmitters or high-voltage lines.**

- If you record near radio transmitters or high-voltage lines, the recorded pictures and/or sound may be adversely affected.

**About connecting to a PC**

- Please use a commercially available cable compatible with the USB 2.0 standard. Connect a miniB terminal to this unit.

**When connecting to the dedicated Camera Head (AG-UCK20G)**

- Always use a genuine Panasonic Camera head option cable (AG-C20003G (3 m (118-1/8")), AG-C20020G (20 m (787-3/8")): optional).

**When connecting to a network**

- LAN cable\* (category 5 or above), max. 100 meters (328 feet)

\* Use of an STP (shielded twisted pair) cable is recommended.

**When connecting to an SDI input/output device**

- To connect to the SDI IN terminal or SDI OUT terminal, use a double-shielded BNC cable equivalent to 5C-FB (commercially-available).

**Note on viewing motion pictures/still pictures on an external monitor**

- Use a commercially-available High Speed HDMI cable. If possible, we recommend using a cable with a length of 3 m (9.84 feet) or less.

**Make sure to use the supplied cords. If you use optional accessories, use the cords and the cables supplied with them.**

**Do not extend the cords and the cables.**

**Do not spray insecticides or volatile chemicals onto the unit.**

- If the unit is sprayed with such chemicals, its body may be marred and the surface finish may peel off.
- Do not leave rubber or plastic products in contact with the unit for a long time.

**When you use the unit in a sandy or dusty place such as a beach, do not let sand or fine dust get into the body and terminals of the unit.**

**Also, keep the unit away from sea water.**

- Sand or dust may damage the unit. (Care should be taken when inserting and removing a card.)
- If sea water splashes onto the unit, wipe off the water with a well wrung cloth. Then wipe the unit again with a dry cloth.

**When carrying the unit, do not drop or bump it.**

- A strong impact can break the unit's casing, causing it to malfunction.

**Cleaning**

**When cleaning, do not use benzine or thinner.**

- Using benzine or paint thinners may deform the recorder and/or cause the surface finish to peel off.
- Before proceeding with maintenance, remove the battery or disconnect the AC cable from the power outlet.
- Use a soft, clean cloth to wipe the recorder. To remove stubborn dirt, wipe the recorder with a cloth moistened with kitchen detergent that has been diluted with water and then use a dry cloth to take up the remaining moisture.

**When you are not going to use the unit for an extended time**

- When storing the unit, it is recommended that you place a desiccant (silica gel) in with it.

**About terminal protection**

- When not using the connecting terminal, please attach the cover.

**Do not allow the cord to drag on the ground or pull a connected cord along the passage**

- The cord will be damaged, causing fire or electrical shock, when the cord gets caught by the feet, excite will also cause personal injury.

## About the battery (optional)

The battery used in this unit is a rechargeable lithium-ion battery. It is susceptible to humidity and temperature and the effect increases the more the temperature rises or falls. In cold areas, the full charge indication may not appear or the low battery indication may appear about 5 minutes after starting use. At high temperatures, the protection function may be triggered, making it impossible to use the unit.

### **Be sure to detach the battery after use.**

- If the battery is left attached, a minute amount of current continues to flow even if the unit is off. Keeping the unit in this state may result in over discharge of the battery. This may result in you not being able to use the battery even after it is charged.
- The battery should be stored in the vinyl bag so metal does not come into contact with the terminals.
- The battery should be stored in a cool place free from humidity, with as constant temperature as possible. (Recommended temperature: 15 °C to 25 °C (59 °F to 77 °F), Recommended humidity: 40%RH to 60%RH)
- Extremely high temperatures or low temperatures will shorten the life of the battery.
- If the battery is kept in high-temperature, high-humidity, or oily-smoky places, the terminals may rust and cause malfunctions.
- To store the battery for a long period of time, we recommend you charge it once every year and store it again after you have completely used up the charged capacity.
- Dust and other matter attached to the battery terminals should be removed.

### **Prepare spare batteries when going out for recording.**

- Prepare batteries enough to last for 3 to 4 times the period you are planning to record for. Cold places such as a ski resort can shorten recording time.

### **If you drop the battery accidentally, check to see if the terminals are damaged.**

- When this unit or battery charger is attached with the terminal part in a deformed state, this unit or battery charger may be damaged.

### **Do not throw old battery into fire.**

- Heating a battery or throwing it into a fire may result in an explosion.

**If the operating time is very short even after the battery has been recharged, the battery has worn out. Please purchase a new battery.**

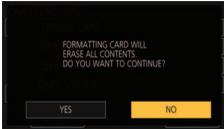
## About the AC adaptor (supplied)/ battery charger (optional)

- If the temperature of the battery is extremely high or extremely low, charging may take time or the battery may not be charged.
- If the CHARGE indicators keeps flashing in orange, make sure that the terminals of the battery or the battery charger are not exposed to dirt, foreign objects or dust, then reconnect them properly. Disconnect the AC cable from the AC outlet when you remove dirt, foreign objects or dust on the terminals of the battery or the battery charger.
- If the battery's temperature is excessively high or excessively low, the CHARGE indicators will blink orange. Charging will start automatically when the battery reaches an acceptable temperature for charging.
- If the CHARGE indicators blinks orange when the battery's temperature is normal, the battery or the battery charger may be malfunctioning. In such cases, contact your dealer.
- If you use the AC adaptor or battery charger near a radio, radio reception may be disturbed. Keep the AC adaptor or battery charger 1 m (3.3 feet) or more away from the radio.
- When using the AC adaptor or battery charger, it may generate whirring sounds. However, this is normal.
- After use, be sure to disconnect the AC cable from the AC outlet. (If you leave this unit connected, the AC adaptor will consume approximately 0.1 W.)
- Always keep the electrodes of the AC adaptor, battery charger and battery clean.
- **Install the device near an AC outlet so that the power disconnection device (AC mains plug) can be accessed easily by hand. After use, remove the battery or unplug the power cord from the outlet.**

## About the SD card (optional)

**When disposing of or giving away the SD card, note that:**

- Formatting and deletion of this unit or computer only changes the file management information and does not completely delete the data in the SD card.
- It is recommended that the main SD card is either physically destroyed or the SD card is physically formatted using this unit when disposing of or giving away the SD card.
- To physically format, connect this unit to the AC adaptor, select [CARD FUNCTION] → [FORMAT CARD] → [SD CARD 1] or [SD CARD 2] from the menu, and touch [YES]. Press and hold REC/PAUSE button in the following screen for three seconds. Screen to delete the SD card data is displayed, so select [YES] and follow the instruction on the screen.



- The customer is responsible for the management of the data in the SD card.

## LCD monitor

- When the LCD monitor is dirty or condensation has occurred, please wipe it using a soft cloth such as a lens cloth.
- Do not touch the LCD monitor with your finger nails, or rub or press with strong force.
- It may become hard to see or hard to recognize the touch when the LCD protection sheet is affixed.
- When the unit has become very cold, for example due to storage in a cold area, its LCD monitor will be slightly darker than usual immediately after the unit is turned on. The normal brightness will be restored when the unit's internal temperature rises.

Extremely high precision technology is employed to produce the LCD Monitor screen. The result is more than 99.99% effective dots with a mere 0.01% of the dots inactive or always lit. However, this is not a malfunction and does not affect the recorded picture.

## About operation from the Web screen

It is possible to distribute the streaming image of the unit (IP image transmission) or change the setup of the unit (IP control) by operating the web browser screen of a PC or mobile terminal connected to the unit via a network. (→ 120, 190)

- The IP image refresh speed and operations from the web screen/remote camera controller may become slower depending on the following factors.
  - Network environment
  - Performance of your PC or mobile terminal
  - Subjects
  - Number of accesses to the unit
  - Writing speed of the SD card being used (when recording to the SD card)
- Do not run the Easy IP Setup Software on a multiple number of personal computers for a single camera and set the IP address at the same time. Otherwise, you will be unable to complete the proper procedure and set the IP address correctly.

## ■ About combination of Memory Card Portable Recorder and Compact Camera Head

This unit (AG-UMR20) is compatible only to the dedicated camera head AG-UCK20G. It will not operate if any other model is connected. The camera head AG-UCK20G will not operate when connected to any recorder other than this unit (AG-UMR20).

## ■ About the recording method for recording motion pictures

This unit can record motion pictures using two different recording methods, including MP4 and AVCHD\*. (→ 32, 41)

\* AVCHD Progressive (1080/59.94p, 1080/50.00p) supported.

### MP4:

These recording methods are suitable for editing images. Audio is recorded in linear PCM.

- Those methods are not compatible with clips in AVCHD format.
- Those methods can record motion pictures in formats that support 4K. 4K motion pictures offer a resolution four times higher than that of full high-definition motion pictures.

### AVCHD:

This recording method is suitable for playback on a high-definition compatible external monitor. Audio is recorded in Dolby Audio™.

## ■ Regarding system frequencies

You can change the system frequency (59.94 Hz/50.00 Hz) for this unit by using the menu. ([SYSTEM FREQ]: → 40)

- You cannot store AVCHD clips recorded with different system frequencies on the same SD card. If you have switched the system frequency, use another SD card.

## ■ Disclaimer of warranty

IN NO EVENT SHALL Panasonic Corporation BE LIABLE TO ANY PARTY OR ANY PERSON, EXCEPT FOR REPLACEMENT OR REASONABLE MAINTENANCE OF THE PRODUCT, FOR THE CASES, INCLUDING BUT NOT LIMITED TO BELOW:

- ① ANY DAMAGE AND LOSS, INCLUDING WITHOUT LIMITATION, DIRECT OR INDIRECT, SPECIAL, CONSEQUENTIAL OR EXEMPLARY, ARISING OUT OF OR RELATING TO THE PRODUCT;
- ② PERSONAL INJURY OR ANY DAMAGE CAUSED BY INAPPROPRIATE USE OR NEGLIGENT OPERATION OF THE USER;
- ③ UNAUTHORIZED DISASSEMBLE, REPAIR OR MODIFICATION OF THE PRODUCT BY THE USER;
- ④ INCONVENIENCE OR ANY LOSS ARISING WHEN IMAGES ARE NOT DISPLAYED, DUE TO ANY REASON OR CAUSE INCLUDING ANY FAILURE OR PROBLEM OF THE PRODUCT;
- ⑤ ANY PROBLEM, CONSEQUENTIAL INCONVENIENCE, OR LOSS OR DAMAGE, ARISING OUT OF THE SYSTEM COMBINED BY THE DEVICES OF THIRD PARTY;
- ⑥ ANY DEMANDS FOR COMPENSATION, CLAIMS, ETC. OCCASIONED BY THE INFRINGEMENT OF PRIVACY BY INDIVIDUALS OR ORGANIZATIONS WHOSE IMAGES WERE SHOT BY THE USER BECAUSE THESE IMAGES (INCLUDING THE RECORDINGS MADE) WERE MADE AVAILABLE BY THE USER TO THE PUBLIC DOMAIN FOR SOME REASON OR OTHER (INCLUDING USE WHEN NETWORK USER AUTHENTICATION IS TURNED OFF) OR BECAUSE THE IMAGES ENDED UP BEING USED FOR UNINTENDED PURPOSES;
- ⑦ LOSS OF REGISTERED DATA CAUSED BY ANY FAILURE (INCLUDING INITIALIZATION OF THE PRODUCT DUE TO FORGOTTEN AUTHENTICATION INFORMATION SUCH AS A USER NAME AND PASSWORD)

## ■ Indemnity about recorded content

Panasonic does not accept any responsibility for damages directly or indirectly due to any type of problems that result in loss of recording or edited content, and does not guarantee any content if recording or editing does not work properly. Likewise, the above also applies in a case where any type of repair is made to the unit.

## ■ Network security

As you will use the unit connected to a network, your attention is called to the following security risks.

- ① Leakage or theft of information through the unit
- ② Use of the unit for illegal operations by persons with malicious intent
- ③ Interference with or stoppage of the unit by persons with malicious intent

It is your responsibility to take precautions such as those described below to protect yourself against the above network security risks.

- Use the unit in a network secured by a firewall, etc.
- If the unit is connected to a network that includes personal computers, make sure that the system is not infected by computer viruses or other malicious entities (using a regularly updated antivirus program, anti-spyware program, etc.).
- Protect your network against unauthorized access by setting up user authentication to restrict users to those who log in with an authorized user name and password. In addition, to prevent third parties from identifying user name information (including passwords), register new user name information and delete the default user name information. For details, refer to “User authentication” on page 130.
- After accessing the unit as an administrator, be sure to close all web browsers.
- Store authentication information (user names and passwords) appropriately so that no third parties will be able to access it.
- Change the administrator password periodically.
- Restrict access to the unit by authenticating the users, for example, to prevent setting information stored on the unit from leaking over the network.
- Do not install the camera in locations where the camera or the cables can be destroyed or damaged by persons with malicious intent.
- Avoid connections that use public lines.

### ● Concerning user authorization

User authentication on the unit can be performed via digest authentication or basic authentication. If basic authentication is used without using a dedicated line equipped with an authentication function, password leaks may occur.

### ● Usage restrictions

Use of the same segment is recommended for the network in which the unit and the controller or personal computer are connected.

If the equipment uses connections with different segments, events based on the settings inherent to the network equipment, for instance, may occur so check this thoroughly prior to operation.

## ■ About security

Be careful about the possibility of theft or loss of the unit, and be careful not to leave the unit unattended. Please note that Panasonic does not accept any responsibility for the compromise, manipulation, and loss of information caused by these events.

## ■ Caution regarding laser beams

The lens may suffer damage if struck by a laser beam. Make sure that laser beams do not strike the lens when shooting in an environment where laser devices are used.

## ■ Cards that you can use with this unit

### SDHC Memory Card and SDXC Memory Card

- 4 GB or more Memory Cards that do not have the SDHC logo or 48 GB or more Memory Cards that do not have the SDXC logo are not based on SD Memory Card Specifications.
- Refer to page 27 for more details on SD cards.

## ■ For the purposes of these operating instructions

- The battery pack is referred to as the “Battery”.
- SDHC Memory Card and SDXC Memory Card are referred to as the “SD card”.
- Function that can be used for CAM Mode:  Function that can be used for SDI Mode:  Function that can be used for Playback Mode: 
- An image created by one recording operation is called a “Clip” and is described as such.
- The Compact Camera Head (AG-UCK20G) sold separately is described as “Camera Head”.
- Clip(s) to be recorded or that was recorded with [PRIORITY MODE] set to [REC/PB] →“MP4 clip(s)”
- Clip(s) to be recorded or that was recorded with [PRIORITY MODE] set to [REC/PB] →“AVCHD clip(s)”
- Notation of < > indicates the setup item name of the USER button that can be set with the menu of [USER SW]→[USER1] to [USER13].
- Pages for reference are indicated by an arrow, for example: → 00
- For the purposes of this manual, the model numbers of the units are given as listed in the table below.

Model number of unit	Model number given in manual
AG-UMR20P	AG-UMR20
AG-UMR20E	
AW-RP50N	AW-RP50
AW-RP120G	AW-RP120
AK-HRP200G	AK-HRP200

- Functions which can be used by Windows only are indicated using the  mark.
- These operating instructions are designed for use with models AG-UMR20P/AG-UMR20E. The illustrations and screen examples used in this document are of the AG-UMR20P.

## ■ About Condensation (When the lens of the Camera Head or the LCD monitor of this unit becomes cloudy)

Condensation occurs when there is a change in temperature or humidity, such as when the unit is taken from outside or a cold room to a warm room. Please be careful, as it may cause the lens, the viewfinder or LCD monitor to become soiled, moldy, or damaged.

When taking the unit to a place which has a different temperature, if the unit is accustomed to the room temperature of the destination for about one hour, condensation can be prevented. (When the difference in temperature is severe, place the unit in a plastic bag or the like, remove air from the bag, and seal the bag.)

When condensation has occurred, remove the battery and/or the AC adaptor and leave the unit like that for about one hour. When the unit becomes accustomed to the surrounding temperature, fogginess will disappear naturally.

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# Accessories

Check the accessories before using this unit.  
Keep the accessories out of reach of children to prevent swallowing.

## AC adaptor



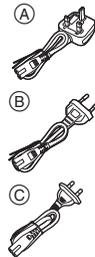
## AC cable

(AG-UMR20P)



(AG-UMR20E)

- (A) For U.K. and Saudi Arabia
- (B) For Continental Europe, etc.
- (C) For India only



### (AG-UMR20E)

#### Caution for AC Mains Lead

FOR YOUR SAFETY PLEASE READ THE FOLLOWING TEXT CAREFULLY.

This product is equipped with 3 types of AC mains cable.

Appropriate mains cable must be used in each local area, since the other type of mains cable is not suitable.

- Be sure to use the supplied AC adaptor.
- To purchase extra accessories, contact your dealer.

# Optional accessories

Some optional accessories may not be available in some countries.

**Product numbers correct as of April 2017. These may be subject to change.**

Battery charger (AG-B23/AG-BRD50)
Battery pack (VW-VBD58/AG-VBR59/AG-VBR89/AG-VBR118)
Compact Camera Head (AG-UCK20G)
Camera head option cable (AG-C20003G [3 m] (118-1/8 ") / AG-C20020G [20 m] (787-3/8 ")

# What you can do with this unit

## Recording to the SD card

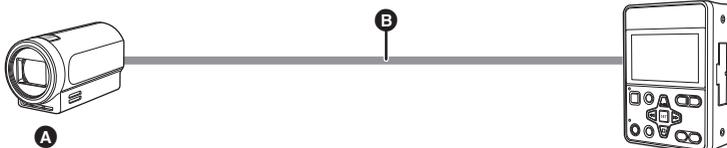
It is possible to record motion pictures and still pictures to the SD card using a variety of recording functions.

- This unit supports relay recording using double card slots.

### Connecting to the Camera Head (optional) to record (CAM Mode) CAM

It is possible to connect to the Camera Head and record onto an SD card.

- It is possible to manually operate Camera Head camera functions such as Zoom, Focus, and IRIS with this unit.

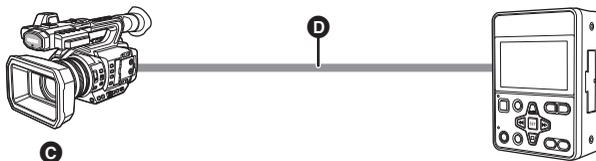


- A** Camera Head
- B** Camera head option cable (optional)

### Input SDI to this unit and record (SDI Mode) SDI

It is possible to connect to external devices (HD camera recorder, HD information camera system etc.) equipped with an HD-SDI output terminal and record video signals, audio signals, time code (SLTC) etc. on the SD card.

- This is suitable for long-term backup recording etc.
- Recording start and stop operation of this unit can be performed from some camera recorders. (When SDI input is selected)



- C** Camera recorder (SDI output device)
- D** BNC cable\*

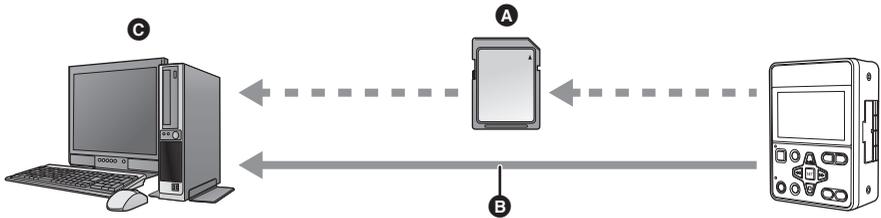
\* To connect to the SDI IN terminal or SDI OUT terminal, use a double-shielded BNC cable equivalent to 5C-FB (commercially-available).

# Linking to external devices

## Connection to a PC (USB connection)

Transfer data (files) to perform nonlinear editing on another device (PC, etc.).

- This unit supports USB 2.0.



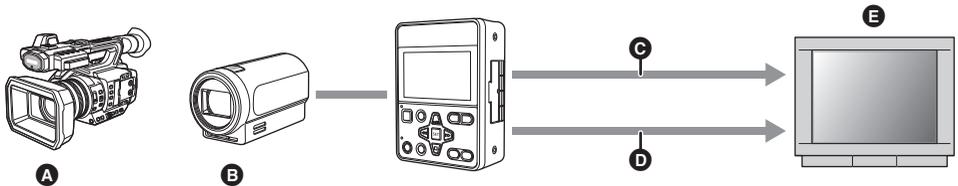
- A** SD card<sup>\*1</sup>      **B** USB 2.0 cable (A-miniB type)<sup>\*2</sup>      **C** PC

\*1 SD cards are optional and not supplied with this unit.

\*2 A USB 2.0 cable is not supplied with this unit. Use a commercially available cable compatible with the USB 2.0 standard. Connect the miniB connector to this unit.

## Connection to external monitor/external device (such as a recorder)

Connect to an external monitor or an external device (such as a recorder) and output video.



- A** Camera recorder (SDI output device)      **C** HDMI cable<sup>\*3</sup>      **E** External monitor/  
**B** Camera Head      **D** BNC cable<sup>\*4</sup>      external device such as a recorder

\*3 Use a commercially-available High Speed HDMI cable. If possible, we recommend using a cable with a length of 3 m (9.84 feet) or less.

\*4 To connect to the SDI IN terminal or SDI OUT terminal, use a double-shielded BNC cable equivalent to 5C-FB (commercially-available).

**When connecting with an HDMI cable using an HDMI-to-DVI converter, etc., be sure to connect the HDMI cable to the connector of this unit last.**

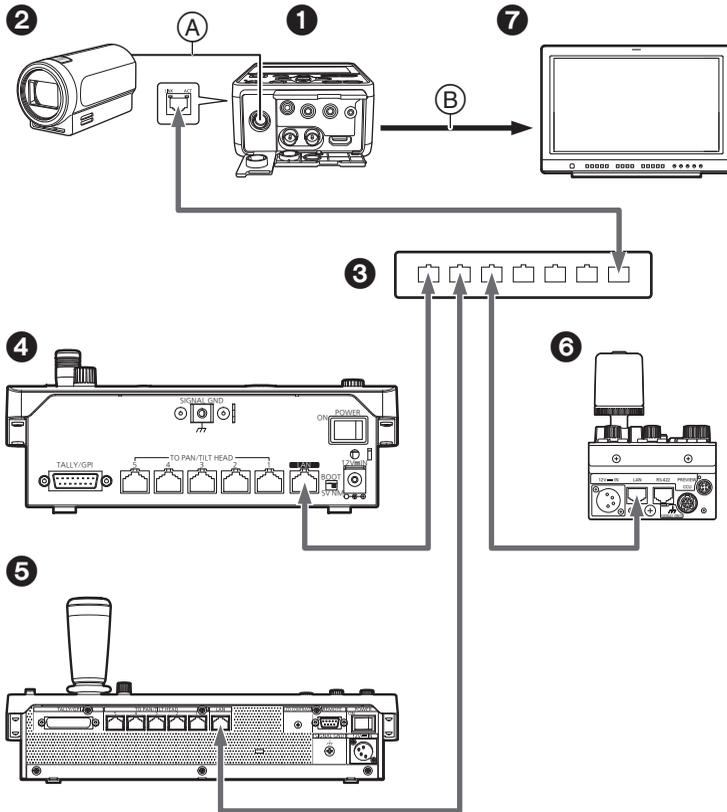
**Connecting the HDMI cable to the connector of this unit first may result in malfunction.**

- When connecting in SDI Mode, it is possible to change the output method to the external device by setting [SDI MODE SEL].
- The video signal of the SDI output may stop temporarily when the HDMI cable is disconnected and connected or the connected monitor is replaced, for example.

# Network connection

## Connection with remote camera controller **CAM**

This unit supports the remote camera controllers AW-RP50/AW-RP120 and the remote operation panel AK-HRP200. (Connection example)



→ : LAN cable

(A) Camera head option cable

(B) HDMI cable/BNC cable

**1** AG-UMR20<sup>\*1</sup>

**2** Camera Head

**3** Switching hub

**4** Remote camera controller AW-RP50<sup>\*1</sup>

**5** Remote camera controller AW-RP120<sup>\*2</sup>

**6** Remote Operation Panel AK-HRP200<sup>\*2</sup>

**7** External monitor

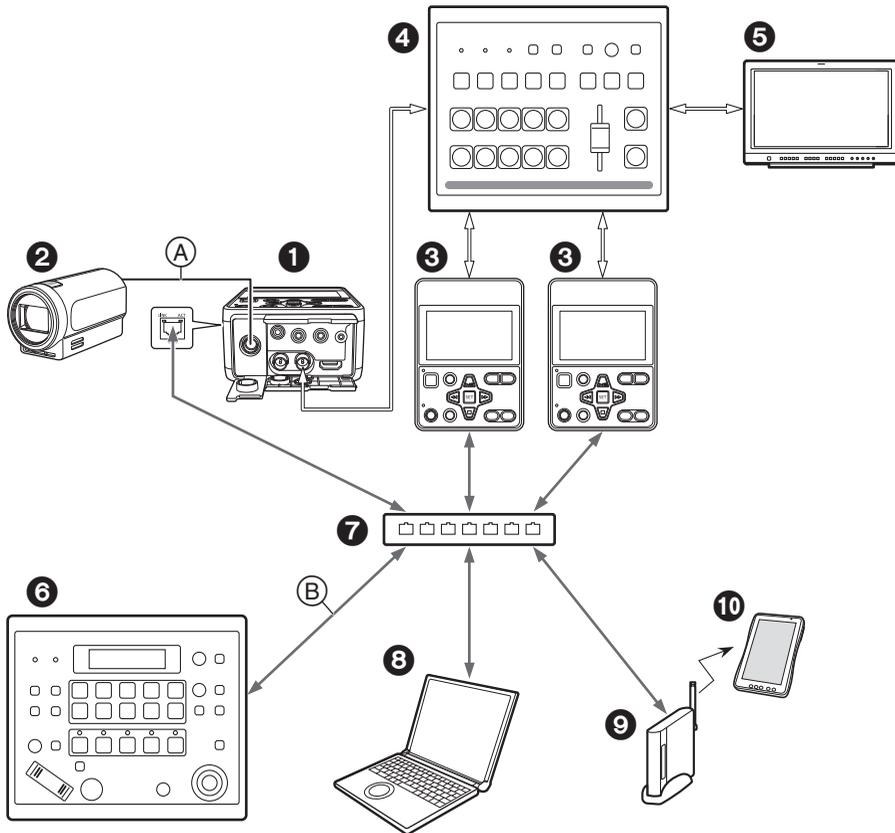
\*1 The illustration of the supplied AC adaptor is omitted.

\*2 The illustration of the external DC power supply is omitted.

• This unit will automatically recognize straight cables and crossover cables connected to the LAN terminal.

## Connection to PC/mobile terminal CAM SDI

This unit can display an IP image on a PC connected to the network via wired LAN or a mobile terminal connected via a wireless access point.  
(Connection example)



➡ : LAN cable  
 ⇨ : BNC cable

(A) Camera head option cable or BNC cable<sup>\*1</sup>  
 (B) LAN cable (straight cable)

- ① AG-UMR20<sup>\*2</sup>
- ② Camera Head or SDI output device
- ③ AG-UMR20<sup>\*3</sup> connected to the Camera Head/SDI output device
- ④ Switcher
- ⑤ External monitor

- ⑥ Remote camera controller AW-RP50<sup>\*2</sup>
- ⑦ Switching hub
- ⑧ PC
- ⑨ Wireless access point
- ⑩ Mobile terminal

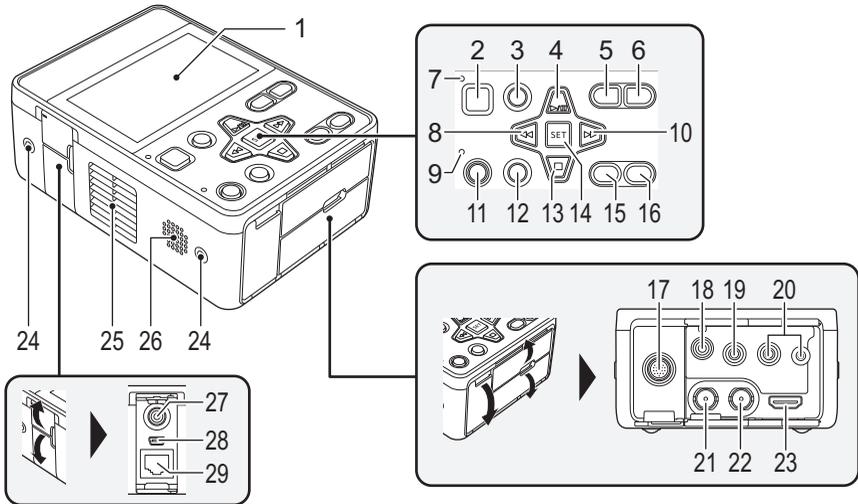
\*1 The cable to be connected and the terminal where the cable plugs in differ depending on the connected device (Camera Head/SDI input device).

\*2 The illustration of the supplied AC adaptor is omitted.

\*3 The illustrations of the Camera Head and SDI output device are omitted.

- This unit will automatically recognize straight cables and crossover cables connected to the LAN terminal.

# Names and Functions of Main Parts



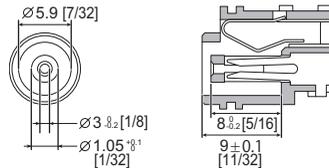
- 1 LCD monitor (Touch screen) (→ 35)
- 2 Power button [ $\text{⏻}$  /  $\text{⏪}$ ] (→ 31)
- 3 Menu button [MENU] (→ 34)
- 4  $\text{⏻}$  button
- 5 AUDIO MON/ADV – button
- 6 AUDIO MON/ADV + button
- 7 Status indicator (→ 31)
- 8  $\text{⏪}$  button
- 9 Tally lamp
- 10  $\text{⏩}$  button
- 11 REC/PAUSE button (→ 41)
- 12 SHIFT button (→ 76)
- 13  $\text{⏻}$  button
- 14 SET button
- 15 MODE button (→ 33)
- 16 User 1 button [USER1] (→ 66)
- 17 CAMERA terminal (→ 29)
- 18 Headphone terminal [ $\text{⏮}$ ] (→ 81, 92)
- 19 MIC/LINE IN input terminal (→ 60)
- 20 Camera remote terminal [CAM REMOTE] (→ 92)
  - FOCUS IRIS terminal (3.5 mm (0.14 ") diameter mini jack)
  - ZOOM S/S terminal (2.5 mm (0.1 ") diameter super mini jack)
- 21 SDI IN terminal [HD SDI IN] (→ 30)
- 22 SDI OUT terminal [HD SDI OUT] (→ 93)
- 23 HDMI OUT terminal [HDMI OUT] (→ 93)
- 24 Multipurpose screw hole
  - M3 (3 mm (0.1 ") diameter) type screws with lengths up to 8 mm (0.3 ") can be used for the four screw holes on the side of this unit.
  - When using screws, do not apply excessive force. Also, if you use a M3 (3 mm (0.1 ") diameter) type screw longer than 8 mm (0.3 ") in length, this unit may be damaged.

## 25 Exhaust opening (cooling fan) (→ 39)

## 26 Speaker

## 27 DC input terminal [DC IN] (→ 24, 226)

- Connect the DC 12 V power source. When the voltage drops to approximately 10 V, if the battery is not connected, the unit will turn off automatically. After that, even if the power supply voltage recovers, it will not turn back on automatically. Please press the power button for at least 2 seconds to turn on the unit.



Units: mm [inch]

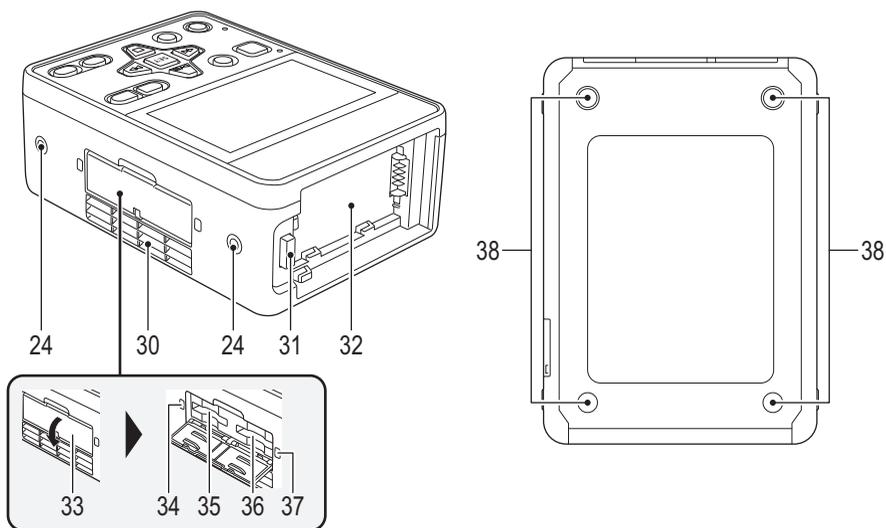
## 28 USB 2.0 terminal (→ 106)

## 29 LAN connector for IP control [LAN ACT/LINK]

- This LAN connector (RJ-45) is connected when exercising IP control over the unit from an external device. Use a cable with the following specifications for the connection to the LAN connector:

LAN cable\* (category 5 or above), max. 100 meters (328 feet)

\* Use of an STP (shielded twisted pair) cable is recommended.



- 30** Inlet (cooling fan) (→ 39)
- 31** Battery release button [PUSH] (→ 25)
- 32** Battery holder (→ 25)
- 33** SD Card slot cover (→ 28)
- 34** Access lamp (card 1) (→ 28)
- 35** Card slot 1 (→ 28)
- 36** Card slot 2 (→ 28)
- 37** Access lamp (card 2) (→ 28)
- 38** Setting legs

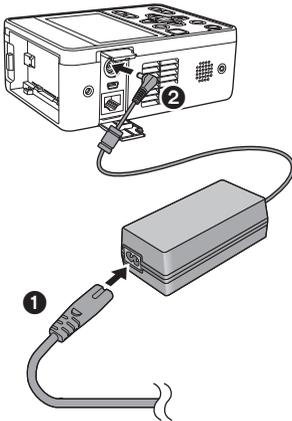
# Power supply

## Using the AC adaptor

The unit is in the standby condition when the AC adaptor is connected. The primary circuit is always “live” as long as the AC adaptor is connected to an electrical outlet.

**Important:**

- Use the supplied AC adaptor. Do not use the AC adaptor of another device.
- Do not use the AC cable with any other equipment as it is designed only for this unit. Also, do not use the AC cable from other equipment with this unit.



- 1 Connect the AC cable to the AC adaptor and the AC outlet.
- 2 Connect the AC adaptor to the DC input terminal [DC IN].

- When disconnecting the AC adaptor, be sure to press and hold the power button to turn off the unit, and check that the status indicator has gone out before removing it. (→ 31)

- Insert the plugs as far as they will go.

- Even when you use the AC adaptor for recording images, keep the battery connected. This allows you to continue the recording even if a power failure occurs or the AC adaptor is unplugged from the AC outlet by accident.
- This unit consumes a small amount of power even when turned off. When leaving the product unused for a long time, disconnect the AC adaptor from the AC outlet for power saving.

## Using the battery

### ■ About batteries that you can use with this unit (as of April 2017)

The battery that can be used with this unit is VW-VBD58/AG-VBR59/AG-VBR89/AG-VBR118.

- The AG-VBR59/AG-VBR89/AG-VBR118 supports quick charging.
- It is recommended to charge with the AG-BRD50 battery charger that supports fast charging.

It has been found that counterfeit battery packs which look very similar to the genuine product are made available to purchase in some markets. Some of these battery packs are not adequately protected with internal protection to meet the requirements of appropriate safety standards. There is a possibility that these battery packs may lead to fire or explosion. Please be advised that we are not liable for any accident or failure occurring as a result of use of a counterfeit battery pack. To ensure that safe products are used we would recommend that a genuine Panasonic battery pack is used.

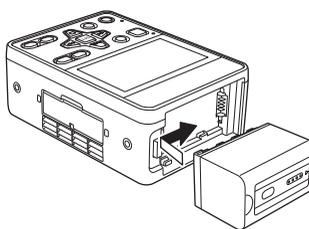
- For information on how to charge the battery, refer to the Operating Instructions for the battery charger.

## Inserting/removing the battery

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**Install the battery by inserting it in the direction shown in the figure.**

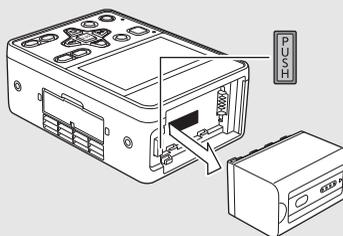
- Insert the battery until it clicks and locks.



### **Removing the battery**

Turn off the unit by pressing and holding the power button until the status indicator is turned off, and remove while holding with hand so it will not fall.

**While pressing the battery release button, remove the battery.**



# Charging and recording time

## Charging/Recording time

Battery model number	Voltage/Capacity (minimum)	Charging time	System Frequency setting (→ 211)	Continuously recordable time	
				CAM Mode	SDI Mode
AG-VBR59 (optional)	7.28 V/5900 mAh	3 h 20 min	59.94 Hz	3 h	6 h 40 min
			50.00 Hz	3 h 10 min	6 h 50 min
VW-VBD58 (optional)	7.2 V/5800 mAh	5 h 20 min	59.94 Hz	2 h 50 min	6 h 25 min
			50.00 Hz	3 h	6 h 30 min
AG-VBR89 (optional)	7.28 V/8850 mAh	4 h	59.94 Hz	4 h 35 min	10 h 10 min
			50.00 Hz	4 h 45 min	10 h 20 min
AG-VBR118 (optional)	7.28 V/11800 mAh	4 h 40 min	59.94 Hz	6 h 5 min	13 h 25 min
			50.00 Hz	6 h 20 min	13 h 40 min

- The charging time is the time when the battery charger AG-BRD50 is used.
- The times given apply when the ambient operating temperature is 25 °C (77 °F) and the relative operating humidity is 60%. Charging time may be longer at other temperatures and humidity levels.
- The continuous recordable time given applies under the conditions below. The time becomes shorter under other conditions.
  - (CAM Mode)  
Recording is performed with [REC FORMAT] set to [PH 1080/59.94i] or [PH 1080/50.00i] when the unit is connected to the Camera Head with a Camera head option cable (AG-C20003G [3 m] (118-1/8 ") ) and not connected to an external device.
  - (SDI Mode)  
Recording is performed with [REC FORMAT] set to [PH 1080/59.94i] or [PH 1080/50.00i].
- "h" is an abbreviation for hour, "min" for minute and "s" for second.
- These times are approximations.
- **The indicated charging time is for when the battery has been discharged completely. Charging time and recordable time vary depending on the usage conditions such as high/low temperature.**

- The batteries heat up after use or charging. This is not a malfunction.
- Use of the optional battery charger AG-B23 (DE-A88), which does not support fast charging, will result in a longer charging time.

### Battery capacity indication

- The display changes as the battery capacity reduces.  If the battery discharges, then  will flash red.
- Depending on the menu setting, the battery capacity indication is not displayed (→ 224) [DISP SETUP] → [CARD & BATTERY]

# Preparation of SD cards

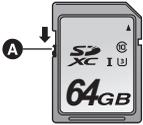
The unit can record motion pictures or still pictures to an SD card.

## Cards that you can use with this unit

- The cards that you can use are correct as of April 2017.
- We recommend that you use a Panasonic Memory Card.

Card type	Capacity
<b>SDHC Memory Card</b>	4 GB to 32 GB
<b>SDXC Memory Card</b>	48 GB to 128 GB

- We do not guarantee the operation of SD cards other than the ones above.
- 4 GB or more Memory Cards that do not have the SDHC logo or 48 GB or more Memory Cards that do not have the SDXC logo are not based on SD Memory Card Specifications.
- When the write-protect switch **A** on SD card is locked, no recording, deletion or editing will be possible on the card.
- Keep the Memory Card out of reach of children to prevent swallowing.



### ■ About the Speed Class ratings for recording motion pictures

- The required card differs depending on the setting of [PRIORITY MODE].  
Use a card that meets the following ratings of the SD Speed Class.  
Use of a non-compatible card may cause recording to stop suddenly.
- SD Speed Class is the speed standards regarding continuous writing. To check the class, see the labelled side, etc. of the card.

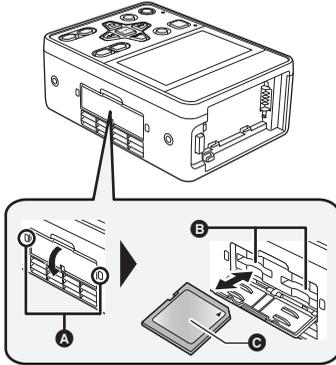
PRIORITY MODE	Speed Class ratings	Label examples
REC/PB(4K)	Class10 or more	CLASS10
REC/PB	Class4 or more	CLASS4

# Inserting/removing an SD card

When using an SD card for the first time, it is necessary to format the SD card. (→ 40) When the SD card is formatted, all of the recorded data is deleted. Once the data is deleted, it cannot be restored.

## Caution:

Check that the access lamp has gone off.



## Access lamp **A**

- When this unit is accessing the SD card, the access lamp lights up.

## 1 Open the SD card slot cover and insert (remove) the SD card into (from) the card slot **B**.

- One SD card can be inserted into each of the card slot 1 and the card slot 2.
- Face the label side **C** in the direction shown in the illustration and press it straight in as far as it will go.
- Press the center of the SD card and then pull it straight out.

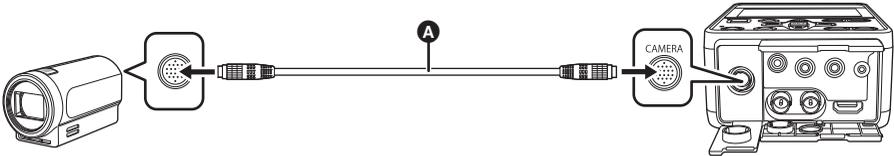
## 2 Securely close the SD card slot cover.

- Do not touch the terminals on the back of the SD card.
- Do not apply strong shocks, bend, or drop the SD card.
- Electrical noise, static electricity or the failure of this unit or the SD card may damage or erase the data stored on the SD card.
- When the card access lamp is lit, do not:
  - Remove the SD card
  - Turn the unit off
  - Insert and remove the USB Cable
  - Expose the unit to vibrations or shockPerforming the above while the lamp is on may result in damage to data/SD card or this unit.
- Do not expose the terminals of the SD card to water, dirt or dust.
- Do not place SD cards in the following areas:
  - In direct sunlight
  - In very dusty or humid areas
  - Near a heater
  - Locations susceptible to significant difference in temperature (condensation can occur.)
  - Where static electricity or electromagnetic waves occur
- To protect SD cards, return them to their cases when you are not using them.
- About disposing of or giving away the SD card. (→ 11)

# Connecting this unit to the Camera Head (CAM Mode)

## ■ Attaching the Camera head option cable (optional)

Be sure to turn off the unit before attaching the Camera head option cable.



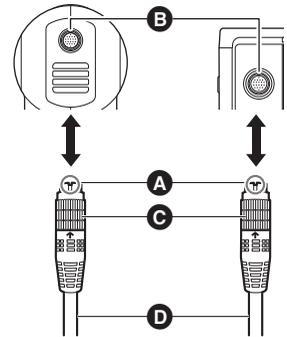
**A** Camera head option cable

### 1 Insert Camera head option cable **D** into this unit's **CAMERA** terminal and the Camera Head connecting terminal.

- Align notch **A** of the terminal of the Camera head option cable with guide **B** of the connecting terminal to insert.

### 2 Turn the Camera head option cable terminal ring **C** clockwise.

- Fix firmly so that there is no looseness.
- This unit will start up in the CAM Mode when it is turned on after connection. The Camera Head is turned on and recording is possible.



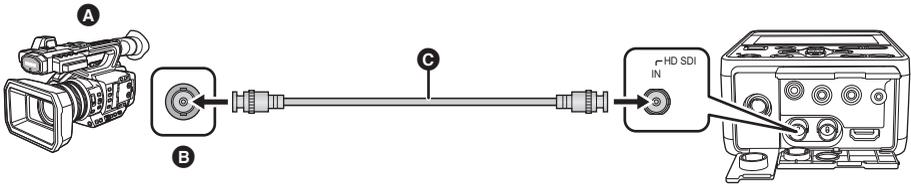
## ■ Removing the Camera head option cable

Be sure to turn off this unit before removing the Camera head option cable.

### 1 Loosen the ring on the terminal of the Camera head option cable by turning it counterclockwise.

### 2 Hold the ring on the terminal of the Camera head option cable and pull it straight out.

# Input SDI to this unit (SDI Mode)



- A** Camera recorder (SDI output device)
- B** SDI OUT terminal
- C** BNC cable (commercially-available)

## Connect the SDI output device to this unit with a BNC cable.

- Use the 5C-FB compatible double shielded cable for the BNC cable (commercially available product) to connect to the SDI IN terminal and the SDI OUT terminal.
- This unit will start up in the SDI Mode when it is turned on as follows.
  - When the power button is pressed and held for 2 seconds or longer when the Camera Head is not connected (→ 31)
  - When the power button is pressed and held for 2 seconds or longer while the USER1 button is pressed and held

## ■ Functions that cannot be set in the SDI Mode

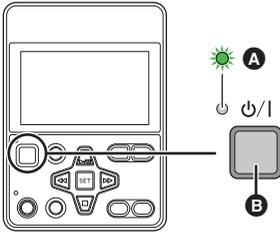
The following functions cannot be set on this unit in the SDI Mode. Set on the SDI output device side.

- Switching Recording Mode (→ 43)
- Adjustment of picture quality (→ 44)
- Zoom (→ 46)
- Image stabilization (→ 47)
- Focus (→ 48)
- White balance (→ 52)
- Iris (→ 54)
- Gain (→ 56)
- Shutter speed (→ 58)
- There are other USER button functions and menus that cannot be used in the SDI Mode. For details, refer to the following pages.
  - Functions of the USER button (→ 67)
  - Using the SHIFT button (→ 76)
  - Menu structure (→ 194)

# Turning the unit on/off

- The method for turning on the unit depends on the setting of [POWER UP OPTION]. (→ 226)

**Press power button **B** for 2 seconds or more to turn on the unit.**



## To turn off the unit

Press the power button for 2 seconds or more.  
The status indicator goes off.

- A** The status indicator lights on.
  - Operation Mode icon (**CAM** / **SDI**) is displayed on the screen.
    - **CAM** (CAM Mode): Displayed when the unit is turned on while connected to the Camera Head.
    - **SDI** (SDI Mode): Displayed when the unit is turned on while not connected to the Camera Head. It is also displayed if the unit is turned on while pressing and holding the USER1 button after connecting the Camera Head.
- 
- This unit may automatically reboot when turned on in the following cases.
    - When turned on for the first time after connecting this unit with the Camera Head
    - When turned on after connecting this unit with another Camera Head
 The setup of the [SCENE FILE] menu saved in the Camera Head is reflected to this unit after the reboot.
  - When in SDI Mode, to turn on the unit again after [ECONOMY (BATT)] or [ECONOMY (AC)] have worked, press the power button for 2 seconds or longer to turn on the unit. (→ 226)
  - Connecting or removing the Camera Head with this unit turned on may cause this unit and the Camera Head to malfunction. Be sure to turn off this unit before connecting/disconnecting the Camera Head to/from it.
  - If the camera head is faulty, such as a fault or a cable disconnection, [System error. Please turn off.] is displayed on the LCD monitor, recording is not possible.
  - If you turn off the unit without pressing the power button by, for example, disconnecting the AC adaptor from the AC outlet, the unit will not memorize the zoom and focus positions, iris and gain values, and shutter speed at that point in time. To have the unit remember the last-used positions and values when it is turned on, follow either of the steps below to have it memorize them.
    - Turn off the unit by pressing the power button.
    - Switch to Playback Mode.

# Selecting a mode

## Switching between the CAM Mode and the SDI Mode

Always turn off this unit and turn it on again when switching between the SDI Mode and the CAM Mode.

- Connect this unit and the Camera Head when switching to the CAM Mode. (→ 29)
- To boot this unit in the SDI Mode with the Camera Head connected, turn on while pressing and holding the USER1 button.

## Switching the priority mode

By switching [PRIORITY MODE], this unit can operate according to various applications.

The items that can be set vary depending on the device to be connected. (CAM Mode: → 29/SDI Mode: → 30)

Select the menu. (→ 34)



○: Recording is possible/—: Recording or distribution is not possible

[PRIORITY MODE] setting	Record to SD card	H.264	JPEG
		IP streaming	
REC/PB(4K) <sup>*1</sup>	○ (MP4 <sup>*3</sup> )	—	Distribution of 1ch is possible
REC/PB <sup>*1</sup>	○ (AVCHD)	Distribution of 1ch is possible	
IP(4K) <sup>*2</sup>	—	Distribution of 2ch is possible	
IP	—	—	—

\*1 Clips recorded on an SD card can be downloaded to a PC and transferred to an FTP server.

\*2 On the Live screen of this unit, 4K image in the H.264 format cannot be displayed. To display 4K images, please use a 4K image-compatible external device or external software.

\*3 This unit is not compatible with clips recorded with AVCHD.

- [IP(4K)] and [REC/PB(4K)] are not available in SDI Mode.

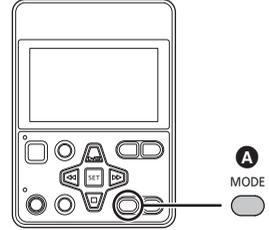
# Switching between Recording Mode and Playback Mode

When [PRIORITY MODE] is set to [REC/PB] or [REC/PB(4K)], press the MODE button to switch between Recording Mode and Playback Mode.

- If set to [IP], [IP(4K)], even if the MODE button is pressed, this unit will not enter Playback Mode.

**Press the MODE button **A** to switch between Recording Mode and Playback Mode.**

<b>Recording Mode (→ 41)</b>	The recording screen is displayed. You can record motion pictures.
<b>Playback Mode (→ 83)</b>	The thumbnail screen for playback is displayed. You can play back clips and still pictures.



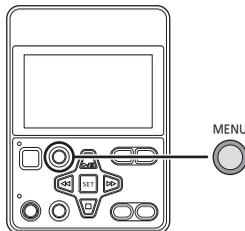
- When you turn on this unit, it starts up in Recording Mode.

## ■ Switching between Recording Mode and Standby Mode

When [PRIORITY MODE] is set to [IP] or [IP(4K)], press the MODE button to switch between Recording Mode and Standby Mode.

- In Standby Mode, this unit appears as follows.
  - The status indicator flashes slowly.
  - Turn off the LCD monitor of this unit.
  - This unit's SDI output, HDMI output and IP distribution stops.
  - In the CAM Mode, functions other than the Camera Head network function and the cooling fan stop.

# Using the menu screen



## Menu setting by button operation

- 1 Press the MENU button  .
- 2 Press the  /  /  /  buttons to move the cursor to the menu, and press the SET button to select.
- 3 Place the cursor on [EXIT] and press the SET button to finish the menu setting.

### ■ About page switching

It is not possible to select the  /  /  /  icon with button operation.

If the cursor is on the top item, press the  button, or if the cursor is on the bottom item, press the  button to switch the page.

### ■ To adjust the numerical value by button operation

In the menu for setting the numerical value, after selecting the numerical display part, press the  /  /  /  buttons to adjust.

(For example, when adjusting the brightness with [LCD SET])

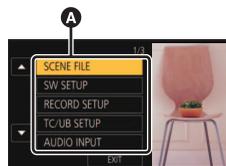
- 1 Place the cursor on the numerical display  and press the SET button to select.
- 2 Press the  /  buttons to adjust the value.
  - When the SET button is pressed, the adjusted value is set.
  - There is also a menu to adjust by pressing the  /  buttons.



# Menu setting by touch screen operation

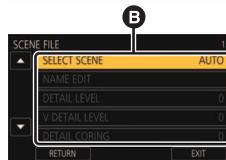
**1** Press the MENU button .

**2** Touch the top menu **A**.



**3** Touch the submenu **B**.

- Next (Previous) page can be displayed by touching  / .



**4** Touch the desired item to enter the setting.

**5** Touch [EXIT] to exit the menu setting.

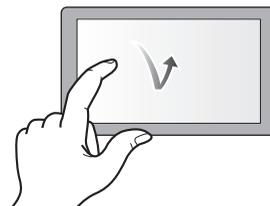
## How to use the touch screen

You can operate by directly touching the LCD monitor (touch screen) with your finger.

### ■ Touch

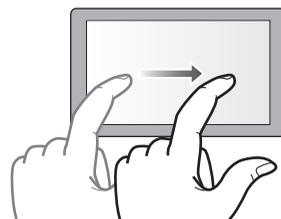
Touch and release the touch screen to select icon or picture.

- Touch the center of the icon.
- Touching the touch screen will not operate while you are touching another part of the touch screen.



### ■ Slide while touching

Move your finger while pressing on the touch screen.



### ■ About the operation icons

 /  /  /  :

Touch when changing a page or performing settings.



[RETURN]:

Returns you to the previous screen.

- Do not touch the LCD monitor with hard pointed tips, such as ball point pens.

# Setting date and time

When this unit is turned on, the message [SET TIME ZONE AND DATE/TIME] may appear.

To make these settings, select [YES], and follow the instructions from Step 2-3 of the time zone setting procedure.

## Time zone

Time difference from the Greenwich Mean Time can be set.

### 1 Select the menu.

 : [OTHER FUNCTION] → [TIME ZONE]

### 2 Touch / and set the region to record.

### 3 Touch [ENTER] to complete the setting.

- If the [CLOCK SET] screen appears, perform [CLOCK SET].
- Touch the MENU button to close the menu screen.

- 
- When the time zone setting is changed, the date/time setting of the unit also changes automatically.

## Clock setting

### 1 Select the menu.

 : [OTHER FUNCTION] → [CLOCK SET]

### 2 Touch the date or time to be set, then set the desired value using / .

- The year can be set between 2000 and 2035.

### 3 Touch [ENTER] to complete the setting.

- Touch the MENU button to close the menu screen.



- 
- The date and time function is driven by a built-in lithium battery.
  - If the time display becomes [- -], the built-in lithium battery needs to be charged. To recharge the built-in lithium battery, connect the AC adaptor or attach a charged battery to this unit. Leave the unit as it is for approx. 24 hours and the battery will maintain the date and time for approx. 6 months. (The battery is still being recharged even if the unit is off.)
  - The way that time is displayed can be changed in the menu settings. (→ 224)  
[DISP SETUP] → [DATE/TIME] or [DATE FORMAT]

## ■ Time zone table

<b>Time difference</b>	<b>Region</b>	<b>Time difference</b>	<b>Region</b>
<b>0:00</b>	London, Casablanca	<b>+3:30</b>	Tehran
<b>-1:00</b>	Azores	<b>+4:00</b>	Dubai, Abu Dhabi
<b>-2:00</b>	Fernando de Noronha	<b>+4:30</b>	Kabul
<b>-3:00</b>	Rio de Janeiro, Sao Paulo, Buenos Aires	<b>+5:00</b>	Islamabad, Karachi, Male
<b>-3:30</b>	Newfoundland	<b>+5:30</b>	Delhi, Kolkata, Mumbai, Chennai, Colombo
<b>-4:00</b>	Manaus, La Paz	<b>+5:45</b>	Kathmandu
<b>-4:30</b>	Caracas	<b>+6:00</b>	Dhaka
<b>-5:00</b>	Toronto, New York, Miami, Lima	<b>+6:30</b>	Yangon
<b>-6:00</b>	Chicago, Houston, Mexico City	<b>+7:00</b>	Bangkok, Jakarta
<b>-7:00</b>	Denver, Phoenix	<b>+8:00</b>	Beijing, Hong Kong, Kuala Lumpur, Singapore
<b>-8:00</b>	Vancouver, Seattle, Los Angeles	<b>+9:00</b>	Seoul, Tokyo
<b>-9:00</b>	Alaska, Anchorage	<b>+9:30</b>	Adelaide
<b>-10:00</b>	Hawaii, Honolulu, Tahiti	<b>+10:00</b>	Guam, Sydney
<b>-11:00</b>	Midway Islands	<b>+11:00</b>	Solomon Islands, New Caledonia
<b>+1:00</b>	Berlin, Paris, Rome, Madrid	<b>+12:00</b>	Fiji, Auckland, Wellington
<b>+2:00</b>	Helsinki, Athens, Cairo, Johannesburg	<b>+12:45</b>	Chatham Islands
<b>+3:00</b>	Moscow, Kuwait, Riyadh, Nairobi		

## Adjusting the LCD monitor

- These settings will not affect the images actually recorded.

### [POWER LCD]

This makes it easier to view the LCD monitor in bright places including outdoors.

**Select the menu.**

 : [DISP SETUP] → [POWER LCD] → [+1] (Makes brighter)/[0] (Normal)/[-1] (Makes less bright)

### [LCD SET]

It adjusts brightness and color density on the LCD monitor.

**1 Select the menu.**

 : [DISP SETUP] → [LCD SET]

**2 Touch the desired setting item.**

<b>[COLOR]:</b>	Color level of the LCD monitor
<b>[BRIGHTNESS]:</b>	Brightness of the LCD monitor
<b>[CONTRAST]:</b>	Contrast of the LCD monitor

**3 Touch  /  to adjust settings.**

- You can select a value between -16 and +16.

**4 Touch [RETURN].**

- Touch [EXIT] to exit the menu screen.

### Reversing the display on the LCD monitor

The LCD monitor can be displayed reversed vertically and horizontally.

**Press the USER button assigned as <LCD REVERSE>.**

- For how to assign functions to the USER buttons, refer to page 65.
- The reversed display and normal display switches every time the button is pressed.

• The reversed display also reverses the horizontal and vertical directions of the  /  /  /  buttons, except for the following functions.

- Zoom control with the  /  buttons
- Functions that operate when one of these buttons and the SHIFT button are pressed simultaneously (→ 76)

• Reversed display can be switched by setting the menu.

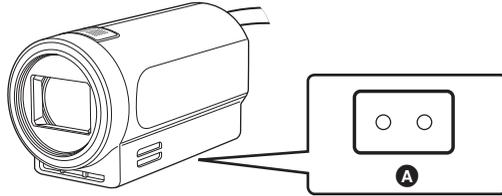
[DISP SETUP] → [LCD REVERSE] → [ON] (reversed display)/[OFF] (normal display)

## Before recording

- When recording, make sure your footing is stable and there is no danger of colliding with another person or object.
- When you are outdoors, record pictures with the sunlight behind you. If the subject is backlit, it will become dark in the recording.
- For stable images, it is recommended to use a tripod whenever possible.
- Do not block the air inlet or exhaust opening of the cooling fan of this unit or the Camera Head with your hands, etc.

### ■ To fix the Camera Head to a tripod CAM

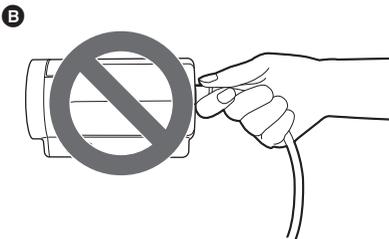
Attach the tripod to the tripod mounting hole of the Camera Head.



#### A Tripod mounting hole

- The depth of the screw hole in the tripod mounting hole is 6 mm (0.24"). When attaching this unit to a tripod or the like, do not tighten the screw with excessive force. Also, if screws other than 1/4-20 UNC type are used, the Camera Head may be damaged.

- 
- When fixing to something other than a tripod, pay attention to the following points.
    - Use the tripod mounting hole to fix securely.
    - Do not block the Camera Head inlet, exhaust opening or built-in microphone with fixing parts.
  - If the Camera Head is held as shown below, a heavy load will be applied to the cable and the terminal, which may cause damage. Also, be careful as the cable may come off and the Camera Head may fall or collide with the surrounding walls and be damaged.



#### B Hold the cable only or fix



#### C Hold the cable only and suspend this unit

### ■ To record reversed vertically and horizontally CAM

The recorded image can be reversed vertically and horizontally by setting [SCAN REVERSE] when the Camera Head is connected. Lch/Rch of the built-in microphone will also switch.

- Use this function for ceiling mount (upside down) installation.

Select the menu.

MENU : [SW SETUP] → [SCAN REVERSE] → [ON]

## Selecting a media to record

You can specify the card slot to which motion pictures are to be recorded.

### Select the menu.

 : [RECORD SETUP] → [MEDIA SELECT] → [SD CARD 1]/[SD CARD 2]

- You can also change the card slot used for motion picture recording by pressing the USER button to which <SLOT SEL> is registered or touching the applicable USER button icon while recording is paused. (→ 65)
- If [PRIORITY MODE] is [IP] or [IP(4K)], it cannot be set.

## Formatting media

If you use the SD cards for the first time for recording with this unit, format the cards.

Please be aware that if a medium is formatted, then all the data recorded on the medium will be erased and cannot be restored. Back up important data on a PC etc. (→ 105)

- When using two SD cards, format both SD cards.

### 1 Select the menu.

 : [CARD FUNCTION] → [FORMAT CARD]

### 2 Touch [SD CARD 1] or [SD CARD 2].

- When formatting is complete, touch [EXIT] to exit the message screen.

- Do not turn this unit off or remove the SD card, while formatting. Do not expose the unit to vibrations or shock.

#### Use this unit to format media.

**Do not format an SD card using any other equipment such as a PC. Otherwise it may not be possible to use the card on this unit.**

## System frequency Selection

Set the system frequency of this unit.

### Select the menu.

(In Recording Mode)

 : [RECORD SETUP] → [SYSTEM FREQ] → desired setting

(In Playback Mode)

 : [OTHER FUNCTION] → [SYSTEM FREQ] → desired setting

**[59.94Hz]:** The system frequency for NTSC television broadcasting system regions

**[50.00Hz]:** The system frequency for PAL television broadcasting system regions

- After you have changed the system frequency, this unit will be restarted automatically.

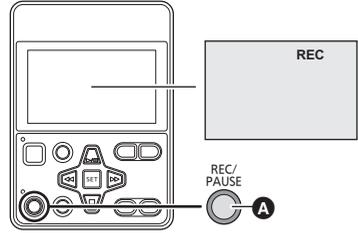
- By default, the system frequency is set to the broadcasting system of the region where this product was purchased.
- AG-UMR20P: This function's default setting is [59.94Hz].
- AG-UMR20E: This function's default setting is [50.00Hz].
- When recording [PRIORITY MODE] with [REC/PB], clips with different system frequencies cannot be recorded on one SD card. Please prepare an SD card for each system frequency.

# Record on SD card

**1** Set [PRIORITY MODE] to [REC/PB] or [REC/PB(4K)] to switch to Recording Mode. (→ 32, 33)

**2** Press REC/PAUSE button **A** to start recording.

- When recording starts, REC (red) appears on the screen and the tally lamp lights up.
- Press again to stop recording.



## ■ Screen indications in the Recording Mode



<b>TC 00:00:00.00</b>	Counter display (→ 62)
<b>1 / 2 (White)</b>	Card slot number
<b>R 1h20m</b>	Approximate remaining recordable time <ul style="list-style-type: none"> <li>• When the remaining time is less than 1 minute, R 0h00m flashes red.</li> </ul>
<b>RELAY</b>	Card slot at the recording destination (→ 40)
<b>4K 2160</b>	Recording format (→ 212)
<b>50M</b>	Bit rate (→ 212)
<b>MP4</b>	MP4 recording
<b>29.97p</b>	Frame rate (→ 212)

- To change the recording method, change [PRIORITY MODE] or [REC FORMAT]. (→ 32, 212)
- The images recorded between pressing the recording start/stop button to start recording and pressing it again to pause recording become one clip.
- The clip is automatically split when the file size of the recorded clip exceeds any of the values below, or the recording time exceeds the length below. (Recording will continue)

<b>AVCHD clip</b>	Approx. 10 hours*
<b>MP4 clip (when using an SDHC Memory Card)</b>	Approx. 4 GB
<b>MP4 clip (when using an SDXC Memory Card)</b>	Approx. 3 hours

\* AVCHD files are automatically divided when their file size exceeds approx. 4 GB.

- When MP4 clips that were generated by automatic splitting are played back in succession, the changeover between them may not be smooth.
- Recording stops momentarily when the continuous recording time reaches approx. 10 hours, and then it resumes automatically after a few seconds.  
Nothing will be recorded for a few seconds until the recording resumes.

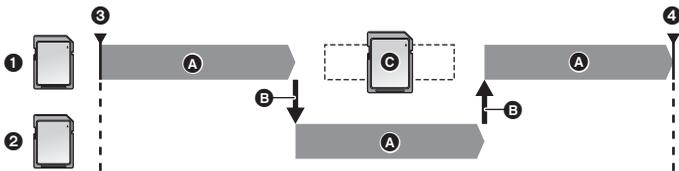
- (Maximum recordable scenes of a single SD card)

PRIORITY MODE	REC/PB(4K)	REC/PB
Recordable clips	Approx. 89100	Approx. 3900
Different dates (→ 88)	Approx. 900	Approx. 900

- The maximum number of recordable clips and the maximum number of different dates will be smaller than the table above when there are both MP4 clips and still pictures recorded on the SD card.
- Number of clips that can be recorded will be less than above in following case:
  - If you change [REC FORMAT]
- Please refer to page 254 about approximate recordable time.
- The recording control to this unit from the camera recorder can be performed when a camera recorder compatible to AUTO REC function is connected in SDI Mode. (→ 81)
- Audio is not output from the built-in speaker during CAM Mode.
- It may take longer to stop recording when PRE-REC is used or [PRIORITY MODE] is set to [REC/PB(4K)].
- The recording is stopped when the screen display is [REC] (flashing in red), so recording cannot be started even when the REC/PAUSE button is pressed. Press the REC/PAUSE button after the [REC] display is turned off.

## ■ Relay recording

This is simple Relay Recording. It is possible to continuously record on the SD card in the other card slot even when the available capacity of the SD card runs out during the recording.



- |                        |   |
|------------------------|---|
| ① Slot 1               | Ⓐ Recording   |
| ② Slot 2               | Ⓑ The card slot used for recording is switched automatically. |
| ③ Recording is started | Ⓒ Replace the SD card with a recordable one.                  |
| ④ Recording is paused  |   |

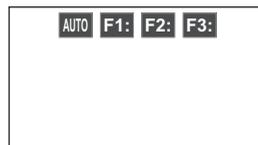
- Even after switching of the recording media, you can replace the SD card that ran out of space with a new one and record the motion picture onto three or more SD cards. Since it may take a while for this unit to recognize a new SD card, replace the SD card that ran out of space when the SD card currently being used as a destination still has sufficient remaining recordable time.

- A message regarding the card remaining capacity is displayed after relay recording. Replace the SD card that has no remaining capacity.

# Switch Recording Mode

There are four Recording Mode presets according to the recording situation on this unit. ([AUTO]/[F1:]/[F2:]/[F3:])  
Touch the appropriate operation icon to switch between Auto Mode ([AUTO]) and Manual Mode ([F1:], [F2:], [F3:]).

Touch **AUTO**, **F1:**, **F2:** or **F3:** to switch between Auto Mode and Manual Mode.



**AUTO** : The optimum setting adjustment is automatically performed according to the recording conditions.

**F1:** / **F2:** / **F3:** \* : Make detailed settings manually according to the recording conditions and preferences.

\* It is possible to save your favorite image settings to each scene number. Please switch the scene number according to the recording situation. Refer to page 200 for the image settings that can be saved.

- If the screen is touched while the operation icons are displayed, or if there is no touch operation for a period of time, the operation icons will disappear. To display again, touch the screen.
- The display duration of operation icons can be changed in [OPERATION ICONS DISPLAY]. (→ 225)
- You can also switch between Auto Mode and Manual Mode by setting the menu.  
[SCENE FILE]→[SELECT SCENE]

## About Auto Mode

In Auto Mode, the following menu items are set automatically. Their settings cannot be changed.

Menu item	Setting
[SCENE FILE] → [DETAIL LEVEL]	0
[SCENE FILE] → [V DETAIL LEVEL]	0
[SCENE FILE] → [DETAIL CORING]	0
[SCENE FILE] → [SKIN TONE DTL]	OFF
[SCENE FILE] → [CHROMA LEVEL]	0
[SCENE FILE] → [CHROMA PHASE]	0
[SCENE FILE] → [COLOR CORRECTION SETTING]	All setup values are set to 0
[SCENE FILE] → [MASTER PED]	0
[SCENE FILE] → [GAMMA]	HD NORM
[SCENE FILE] → [BLACK GAMMA]	0
[SCENE FILE] → [KNEE]	AUTO
[SCENE FILE] → [DRS]	OFF
[SCENE FILE] → [NR CONTROL]	0
[SW SETUP] → [IRIS MODE]	AUTO
[SW SETUP] → [GAIN MODE]	AUTO
[SW SETUP] → [SUPER GAIN]	OFF

## Controls that are disabled in Auto Mode

In Auto Mode, the following operation is invalid.

- pressing the USER button set for <SUPER GAIN>

# Adjusting the Picture Quality

You can set the picture quality of images to be recorded in the main menu → [SCENE FILE].

## Detail function

This function thickens or weakens the outlines of images. It effectively softens or sharpens images, but in some cases, the whole image may become rough due to emphasized noise and edges. To avoid such problems, it is necessary not to add this effect on parts where emphasizing is not needed and keep the details of the parts.

### ■ Menu item

[DETAIL LEVEL]:	Adjusts the degree of overall outline correction in images. (→ 201)
[V DETAIL LEVEL]:	Adjusts the degree of vertical outline correction in images. (→ 201)
[DETAIL CORING]:	Adjusts the detail noise removal level. (→ 201)
[SKIN TONE DTL]:	Makes skin colors appear softer for a more attractive appearance. (→ 202)

## RB gain control function

When the White Balance mode is set to [AWB A] (Ach), [AWB B] (Bch) or [VAR], this function enhances or reduces the intensity of red and blue.

- It does not work when the White Balance mode is set to [ATW], [P3200K], or [P5600K].

### ■ Menu item

[WB R GAIN] (→ 202)
[WB B GAIN] (→ 202)

- 
- When the Auto White Balance/Auto Black Balance is performed, the setup for [WB R GAIN] and [WB B GAIN] will be set to 0. (→ 53)

## Chroma setting function

This function sets color saturation and phase. It applies effects on whole images. It cannot be set to individual color hue.

### ■ Menu item

[CHROMA LEVEL]:	Adjusts the color density. (→ 203)
[CHROMA PHASE]:	Adjusts the color balance. (→ 203)

## Color matrix setup function

This function sets color saturation and phase. It applies individual effect on 16 phases in an image.

### ■ Menu item

[MATRIX]:	Loads the preset color matrix data and compensates the saturation and phase accordingly. (→ 203)
[COLOR CORRECTION SETTING]:	Allows you to set the saturation and phase of each of the 16 image axes. (→ 204)

## Black control function

This function sets the black level that is to be the reference of luminance.

### ■ Menu item

[MASTER PED] (→ 205)

## Gamma function

This function optimizes the tone of images.

### ■ Menu item

[GAMMA]:	Sets the optimal tone and contrast of images for the scene to be recorded. (→ 205)
[BLACK GAMMA]:	Sets the gamma curve for dark areas. (→ 205)

## Knee function

This function sets the compression of video signals to prevent white saturation in images.

### ■ Menu item

[KNEE]:	Sets the compression level of highly bright image signals received by the image sensor to minimize white saturation. (→ 205)
---------	--

## DRS function

Set the DRS (Dynamic Range Stretcher) function to automatically suppress underexposure and overexposure.

### ■ Menu item

[DRS] (→ 206)

## NR control function

Adjust the noise reduction effect and the afterimage level.

### ■ Menu item

[NR CONTROL] (→ 206)

## Using the zoom

The unit can deliver a maximum optical zoom of 20 $\times$ .

- You can check the zoom magnification on-screen, displayed as a value between Z00 and Z99. The value gets larger as you zoom in, and smaller as you zoom out.

Press the  /  buttons to zoom.

 : Close-up recording (zoom in)

 : Wide-angle recording (zoom out)

### ■ About the zoom speed

- Hold down the button to perform zoom operation at low speed and press and hold the button after pressing twice in succession to zoom in at high speed.
- 
- It is also possible to zoom in at low speed by pressing the USER buttons (except the USER1 button) that are set for <ZOOM T> or <ZOOM W>. ([→ 65](#))
  - If the Camera Head and the unit are close to each other, when your finger is released from the button during the zoom operation, the operation sound may be recorded. When you release the button, please return it gently.
  - If you switch to Playback Mode or turn off the unit with the power button, the unit memorizes the zoom and focus positions, iris and gain values, and shutter speed.
  - If you turn off the unit without pressing the power button by, for example, disconnecting the AC adaptor from the AC outlet, the unit will not memorize the current zoom and focus positions, iris/gain value, and shutter speed at that point in time.
  - When the zoom magnification is at the maximum magnification, the minimum focusing distance is approximately 1.5 m (4.9 feet).
  - When the zoom magnification is  $\times 1$ , the minimum focusing distance is approximately 3 cm (1.2").
  - The sound of the zoom mechanism becomes louder than usual during fast zoom operation. This may cause the sound to be recorded during recording.
  - Depending on the subject, Auto Focus may not track it when Fast Zoom is in use.

## Using the i.ZOOM

When [i.ZOOM] is set to [ON], you can zoom in while maintaining the beauty of high-definition picture quality up to a magnification of approx. 30 $\times$ .

The zoom magnification when [i.ZOOM] is set depends on the setup of [PRIORITY MODE].

- When set to [IP] or [REC/PB]: Approx. 30 $\times$
- When set to [IP(4K)] or [REC/PB(4K)]: Approx. 22 $\times$

Select the menu.

 : [SW SETUP]  $\rightarrow$  [i.ZOOM]  $\rightarrow$  [ON]

- The zoom magnification display will change.  
(Example)
  - iZ00 to iZ99: magnification levels that fall in the optical zoom range
  -  Z99: i.ZOOM

- This item cannot be set during Freeze Frame. ([→ 69](#))

### Utilizing the USER button

Digital Zoom can be used by registering <D.ZOOM> to a USER button. ([→ 68](#))

- Please refer to page [65](#) for details about setting the USER button.

# Image stabilization

Blurring of image can be decreased by the image stabilization.

Optical image stabilization (O.I.S.) or hybrid image stabilization (Hybrid O.I.S.) can be used.

Hybrid image stabilization is the image stabilization using both optical and electronic image stabilization.

**1 Register <O.I.S.> to a USER button. (→ 65)**

**2 Switch on/off the image stabilization by pressing the USER button assigned as <O.I.S.>, or touching the USER button icon.**



- You can also access this function by selecting menu items.

[SW SETUP] → [O.I.S.] → [ON]/[OFF]

- When [HYBRID O.I.S. MODE] is [ON],  is displayed. When [OFF],  is displayed.

## ■ To switch the image stabilization mode

Select the menu.

 : [SW SETUP] → [HYBRID O.I.S. MODE] → desired setting

**[ON]:** Use the image stabilization (hybrid O.I.S.: 5-axis correction) function.

**[OFF]:** Use the image stabilization (O.I.S.: 2-axis correction) function.

- The angle of view will change if you select [ON].
- It will be set to [OFF] in the following cases, and the setup cannot be changed.
  - When [PRIORITY MODE] is set to [REC/PB(4K)] or [IP(4K)]

## ■ Custom O.I.S. setup

The image stabilization effect can be switched depending on the recording style.

Select the menu.

 : [SW SETUP] → [CUSTOM O.I.S. SETUP] → desired setting

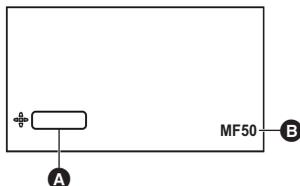
**[NORMAL]:** The setup appropriate for general shaking such as handheld.  
Use this setup for stronger stabilization.

**[STATIONARY]:** The setup appropriate for shaking of the building when fixed to a ceiling or when a camera platform is used.  
Use this setup to suppress unwanted stabilization triggered by panning/tilting, etc.

- Stabilization may not be possible under strong shaking conditions.
- When using a tripod, we recommend that you set the Image Stabilizer to  (setting canceled).
- Compared to O.I.S., Hybrid O.I.S. can produce stronger compensation.  
Hybrid O.I.S. performs compensation (electronic) on movement detected in the video signal. As a result, depending on the recording conditions, it may perform compensation without differentiating between movement of the subject and movement of the unit.
- On/off of the image stabilization, and setup of [HYBRID O.I.S. MODE] or [CUSTOM O.I.S. SETUP] cannot be changed in the following cases.
  - During Freeze Frame (→ 69)
  - During REC check (→ 71)

# Focus

Adjust manually when the unit does not focus automatically.



- A** Multi manual icon [FOCUS]
- B** Focus value

- Switch to Manual Mode. (→ 43)

## 1 Perform menu setup for [FOCUS], and set to Manual Focus Mode.

**MENU** : [SW SETUP] → [FOCUS] → [MANUAL]

- It will switch to MF from AF.

## 2 Confirm that the multi manual icon [FOCUS] (yellow display: Function Selection Mode) is displayed, and press the SET button.

- Touch the screen if the operation icon is displayed.
- The multi manual icon will change to white. (Function Execution Mode)

## 3 Adjust by pressing the ◀ / ▶ buttons.

- Press and hold either of these buttons to adjust continuously.
- Press the SET button when the adjustment is completed. The multi manual icon will change to yellow.
- The focus value can be set from MF00 (Focus distance\*: approximately 3 cm (1.2")) to MF99 (Focus distance\*: infinity). The larger the focus value gets, the further the position where focus is achieved.
- \* Focus distance refers to the minimum distance where a subject can be brought into focus.
- The step by which the focus value is adjusted each time either of the ◀ / ▶ buttons is pressed varies depending on the zoom magnification and focus position. In some situations, the focus value may not change.
- To return to Auto Focus, set [FOCUS] to [AUTO].

- When the distance to the subject approaches within 1.5 m (4.9 feet) approx., the unit switches to the macro range and [AF] or [MF]. (The unit may switch to the macro range even when the distance to the subject is 1.5 m (4.9 feet) or more depending on the subject.)
- Depending on the zoom magnification, this unit may fail to switch to the macro range, or go to a non-displayed focus value.
- When you perform a zoom operation in the macro range, this unit may go out of focus.
- Focus can be adjusted even during the Auto Focus Mode. Auto Focus will operate again after the adjustment.
- If you switch to Playback Mode or turn off the unit with the power button, the unit memorizes the zoom and focus positions, iris and gain values, and shutter speed.
- If you turn off the unit without pressing the power button by, for example, disconnecting the AC adaptor from the AC outlet, the unit will not memorize the current zoom and focus positions, iris/gain value, and shutter speed at that point in time.

## Auto Focus

The unit focuses automatically.

- Auto Focus will not operate correctly in the following cases. Record pictures in the Manual Focus Mode.
  - Recording distant and close-up objects at the same time
  - Recording a subject behind dirty or dusty window
  - Recording a subject that is surrounded by objects with glossy surfaces or by highly reflective objects
  - Recording in dark location
  - Recording fast moving subject
  - Recording object with low contrast

## ■ To emphasize the outline of images CAM SDI

Setting [LCD DETAIL] to [ON] helps you achieve focus easier by emphasizing the outlines of an image displayed on the LCD monitor.

You can also adjust the emphasis level or change the frequency.

- You can also enable or disable this function with the applicable USER button. (→ 73)
- These settings will not affect the images actually recorded.

 : [DISP SETUP] → [LCD DETAIL] → [ON]

### *Adjusting the level of [LCD DETAIL]*

#### 1 Select the menu.

 : [DISP SETUP] → [LCD PEAK LEVEL]

#### 2 Touch / to adjust settings.

- You can select a value between -3 and +3.

#### 3 Touch [EXIT] to complete the setting.

### *Setting the peaking frequency of [LCD DETAIL]*

#### Select the menu.

 : [DISP SETUP] → [LCD PEAK FREQ.] → [HIGH] or [LOW]

- 
- In the following cases, [LCD DETAIL] will be set to [OFF], and the setup cannot be changed.
    - During Focus Assist (→ 51)

## ■ CUSTOM AF STABILITY setup CAM

How easily Auto Focus starts focusing while the image is zoomed in can be adjusted.

- Switch to Auto Focus Mode. (→ 48)

#### 1 Select the menu.

 : [SW SETUP] → [CUSTOM AF STABILITY]

#### 2 Touch / to adjust settings.

- You can select a value between 1 and 3.
- Auto Focus will start focusing to respond to the movement of subjects less quickly when a larger value is selected.

#### 3 Touch [EXIT] to complete the setting.

## Using the PUSH AUTO function CAM

---

### Auto High-Speed Focus

- Switch to Manual Focus Mode. ([→ 48](#))

Press the  button while pressing and holding the SHIFT button.

- Auto Focus will be activated and the camera will perform high-speed focusing until the image is focused.
- The focus setting returns to Manual Focus Mode once the image is focused or a certain time has elapsed.

### Set to Auto Focus temporarily

- Switch to Manual Focus Mode. ([→ 48](#))

Press and hold the  button while pressing and holding the SHIFT button.

- After Auto Focus is activated and Auto High-Speed Focus is performed, the focus point automatically tracks the focused subject at the center of the screen.
  - Auto Focus will be canceled when the button is released, but the focus position set by Auto Focus will be maintained.
- 
- It is also possible to use the PUSH AUTO function with the USER button assigned as <PUSH AUTO>. ([→ 65](#))
  - The PUSH AUTO function will not operate in the following cases.
    - When Auto Focus is used

# Focus Assist CAM

A color is displayed on the part that is focused when Focus Assist is used. (Peaking display)

- Switch to Manual Focus Mode. (→ 48)

Press the  button while pressing and holding the **SHIFT** button.

- Press again to cancel.

**A**: Peaking



## ■ To change the peaking settings

You can set the peaking color and strength.

(When changing the peaking color)

Select the menu.

 : [DISP SETUP] → [PEAKING COLOR] → desired color

[Red]/[Blue]/[Yellow]/[White]

(When setting the peaking strength)

**1** Select the menu.

 : [DISP SETUP] → [PEAKING LEVEL] → desired setting

**2** Touch  /  to adjust settings.

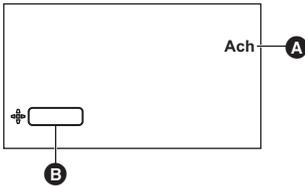
- You can select a value between -7 and +7.

**3** Touch [EXIT] to complete the setting.

- 
- Focus Assist can also be used by pressing the USER button assigned as <FA>. (→ 65)
  - Focus Assist is not possible in following cases:
    - During Recording Check (→ 71)
    - During Freeze Frame (→ 69)
    - When color bars are displayed (→ 73)
  - Focus Assist is canceled in following cases:
    - If you turn the unit off
    - When you set this unit to Auto Focus
  - The peaking display is not displayed on the image that is actually recorded.
  - The peaking display is not displayed on the external monitor.
  - Freeze Frame is not available when you use Focus Assist. (→ 69)
  - Peaking may not be displayed when you use Digital Zoom (→ 68).

# White Balance

Automatic White Balance function may not reproduce natural colors depending on the scenes or lighting conditions. If so, you can adjust the White Balance manually.



- A** White Balance
- B** Multi manual icon [WB]

- Switch to Manual Mode. (→ 43)

Perform menu setup for [WHITE BALANCE MODE], and switch the mode for White Balance.

 : [SW SETUP] → [WHITE BALANCE MODE] → desired color

[ATW]/[AWB A]/[AWB B]/[P3200K]/[P5600K]/[VAR]

Item name	Screen display	Settings
ATW	ATW	It will automatically adjust in accordance with the recording condition.
AWB A	Ach	Setup to match the recording screen is possible. (→ 53)
AWB B	Bch	
P3200K	P3200K	Preset value for studio/indoor recording (halogen lamp, etc.)
P5600K	P5600K	Preset value for outdoors
VAR	VAR	Setting can be finely adjusted in accordance to the recording conditions. (→ 53)

## ■ To switch the mode for White Balance with button operation

### 1 Display the multi manual icon [WB] (yellow display: Function Selection Mode).

- Switch by pressing the  /  buttons if it is not displayed.
- Touch the screen if the operation icon is displayed.

### 2 Press the SET button.

- The multi manual icon will change to white. (Function Execution Mode).

### 3 Press the / buttons to switch the White Balance mode.

- Press the SET button after the adjustment is completed. The multi manual icon will change to yellow.

- By changing the [WB R GAIN] and [WB B GAIN] setup, the hue for [AWB A] (Ach), [AWB B] (Bch), and [VAR] can be adjusted. (→ 202)

## To set ATW Lock

You can set ATW Lock by registering <ATW LOCK> to a USER button.

- Please refer to page 65 for details about setting the USER button.

### 1 Set the White Balance mode to [ATW].

### 2 Press the USER button to which <ATW LOCK> is registered or touch the applicable USER button icon.

- The screen display will change from [ATW] to [LOCK].
- To cancel ATW Lock, press the USER button or touch the USER button icon again. Canceling ATW Lock will return the White Balance mode back to [ATW].

- 
- This function is not available in the following cases:

- When the White Balance mode is set to something other than [ATW]

- It will be canceled when the unit is turned off.

## To finely adjust the White Balance

Setting the White Balance mode to [VAR] allows you to set a White Balance value between 2000K and 15000K.

- Switch to Manual Mode. (→ 43)

### 1 Set the White Balance mode to [VAR]. (→ 52)

### 2 Press the SET button.

- The color temperature display will change to yellow.

### 3 Adjust the hue by pressing the ◀ / ▶ buttons.

- This can be set in the range of 2000K to 15000K.

### 4 Press the SET button to complete the setup.

- 
- You can also access this setting by selecting menu items.

[SW SETUP] → [VAR] (→ 209)

- The set value is not guaranteed to be an exact value. Use it only as a guide.

## To set the White Balance in accordance to the recording scene

### 1 Fill the screen with a white subject or place a white piece of paper in front of the lens.

### 2 Set the White Balance mode to [AWB A] (Ach) or [AWB B] (Bch).

### 3 Perform the Auto White Balance by pressing or pressing and holding the button while pressing and holding the SHIFT button.

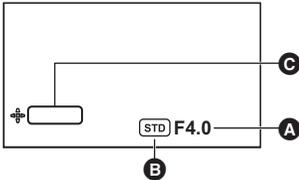
- Only the Auto White Balance is performed when the  button is pressed. [WB SET OK] is displayed and the adjustment will complete.
- The Auto White Balance is performed after performing the Auto Black Balance when the  button is pressed and held. The screen is blacked out momentarily, then [WB SET OK] is displayed and the adjustment is completed.

- 
- If the White Balance mode is set to anything other than [AWB A] (Ach) or [AWB B] (Bch), Auto Black Balance is performed by pressing and holding the button while pressing and holding the SHIFT button. The screen is blacked out momentarily, then [BB SET OK] is displayed and the adjustment is completed.
  - When the Auto White Balance/Auto Black Balance cannot be performed, an error message “WB SET NG” or “BB SET NG” is displayed on the screen. In such case, use other mode.
  - The contents previously set are maintained in the [AWB A] (Ach) or [AWB B] (Bch). Perform the setting again when the recording condition has changed.
  - When the Auto White Balance/Auto Black Balance is performed, the setup for [WB R GAIN] and [WB B GAIN] will be set to 0.

# Iris/Gain adjustment

When recording a scene that is too dark (or bright) or a scene in a similar situation, manually adjust the iris and gain.

## Iris adjustment



- A** Iris value
  - B** Auto iris icon\*
  - C** Multi manual icon [IRIS]
- \* It is displayed in Auto Iris Mode.

- Switch to Manual Mode. (→ 43)

### 1 Perform menu setup for [IRIS MODE], and set to Manual Iris Mode.

MENU : [SW SETUP] → [IRIS MODE] → [MANUAL]

- [STD] disappears.

### 2 Confirm that the multi manual icon [IRIS] (yellow display: Function Selection Mode) is displayed, and press the SET button.

- Touch the screen if the operation icon is displayed.
- The multi manual icon will change to white. (Function Execution Mode)

### 3 Adjust by pressing the ◀ / ▶ buttons.

- Press the SET button when the adjustment is completed. The multi manual icon will change to yellow.

**Iris value:**

**CLOSE** (↔ (F11 to F1.9) ↔ **OPEN**

- Value closer to CLOSE darken the image.
- Value closer to OPEN brighten the image.
- To return to Auto Iris Mode, either switch to Auto Mode (→ 43), or set [IRIS MODE] to [AUTO].

- 
- This cannot be set for the following cases.
    - During Freeze Frame (→ 69)
    - During Infrared Recording Mode (→ 69)
  - Depending on the zoom magnification, there are iris values that are not displayed.
  - In Auto Gain Mode or Auto Shutter Mode, the screen brightness may not change even if you adjust the iris. (→ 56, 58)
  - If you switch to Playback Mode or turn off the unit with the power button, the unit memorizes the zoom and focus positions, iris and gain values, and shutter speed.
  - If you turn off the unit without pressing the power button by, for example, disconnecting the AC adaptor from the AC outlet, the unit will not memorize the current zoom and focus positions, iris/gain value, and shutter speed at that point in time.

## To adjust the brightness during auto adjustment

Brightness can be adjusted by setting [AE LEVEL], [BACKLIGHT COMPENS.] / <BACKLIGHT>, [SPOTLIGHT COMPENS.] / <SPOTLIGHT> when the Auto Mode is set, or when one of [IRIS MODE], [GAIN MODE], or [SHUTTER MODE] is set to [AUTO].

### ■ Setting the [AE LEVEL]

- Set to Auto Mode (→ 43) or set one of [IRIS MODE], [GAIN MODE] or [SHUTTER MODE] to [AUTO] (→ 207, 208)

#### 1 Select the menu.

 : [SW SETUP] → [AE LEVEL]

#### 2 Touch / to adjust settings.

- You can select a value between -10 and +10.

#### 3 Touch [EXIT] to complete the setting.

- 
- Depending on the recording conditions and the item that is set to [AUTO], even if you adjust the [AE LEVEL], the brightness may not change.

### ■ Setting the [BACKLIGHT COMPENS.]

Switches to automatic control to compensate the backlight.  
This makes the image brighter to prevent darkening of a backlit subject.

- Register <BACKLIGHT> to a USER button. (→ 65)
- Set to Auto Mode (→ 43) or set one of [IRIS MODE], [GAIN MODE] or [SHUTTER MODE] to [AUTO] (→ 207, 208)

**Press the USER button assigned as <BACKLIGHT> or touch the USER button icon.**

- To cancel, press the USER button again, or touch the USER button icon again.
-  appears when it is set.

- 
- It is also possible to set this item by following the menu path:

[SW SETUP] → [BACKLIGHT COMPENS.] → [ON]/[OFF]

- This function cannot be used if [IRIS MODE], [GAIN MODE], and [SHUTTER MODE] are all set to [MANUAL].
- This is canceled when turned off.

### ■ Setting the [SPOTLIGHT COMPENS.]

Switches to automatic control for spotlight.  
Very bright object is recorded clearly.

- Register <SPOTLIGHT> to a USER button. (→ 65)
- Set to Auto Mode (→ 43) or set one of [IRIS MODE], [GAIN MODE] or [SHUTTER MODE] to [AUTO] (→ 207, 208)

**Press the USER button assigned as <SPOTLIGHT> or touch the USER button icon.**

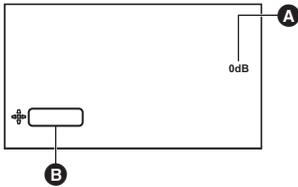
- To cancel, press the USER button again, or touch the USER button icon again.
-  appears when it is set.

- 
- It is also possible to set this item by following the menu path:

[SW SETUP] → [SPOTLIGHT COMPENS.] → [ON]/[OFF]

- This function cannot be used if [IRIS MODE], [GAIN MODE], and [SHUTTER MODE] are all set to [MANUAL].
- This is canceled when turned off.

# Gain adjustment



- A** Gain value
  - In Auto Gain Mode, "AGC" is displayed; in Manual Gain Mode, the gain value is displayed in dB.
- B** Multi manual icon [GAIN]

- Switch to Manual Mode. (→ 43)

## 1 Perform menu setup for [GAIN MODE], and set to Manual Gain Mode.

MENU : [SW SETUP] → [GAIN MODE] → [MANUAL]

## 2 Confirm that the multi manual icon [ GAIN] (yellow display: Function Selection Mode) is displayed, and press the SET button.

- Touch the screen if the operation icon is displayed.
- The multi manual icon will change to white. (Function Execution Mode)

## 3 Adjust by pressing the / buttons.

- Press the SET button when the adjustment is completed. The multi manual icon will change to yellow.

### Gain value:

0dB to 30dB

- Value closer to 0dB darken the image.
- Value closer to 30dB brighten the image.
- To return to Auto Gain Mode, either switch to Auto Mode (→ 43) or set [GAIN MODE] to [AUTO].
- The selected gain value is not maintained if any of the following operations is performed:
  - Switching to Auto Gain Mode

- 
- The gain value cannot be adjusted for the following cases.
    - During Freeze Frame (→ 69)
  - If the gain value is increased, the noise on the screen increases.
  - In Auto Iris Mode or Auto Shutter Mode, the screen brightness may not change even if you adjust the gain. (→ 54, 58)
  - If you switch to Playback Mode or turn off the unit with the power button, the unit memorizes the zoom and focus positions, iris and gain values, and shutter speed.
  - If you turn off the unit without pressing the power button by, for example, disconnecting the AC adaptor from the AC outlet, the unit will not memorize the current zoom and focus positions, iris/gain value, and shutter speed at that point in time.

## ■ Changing the maximum possible gain value for Auto Gain Mode

Select the menu.

 : [SW SETUP] → [AGC LIMIT] → desired setting

[3 dB]/[6 dB]/[9 dB]/[12 dB]/[15 dB]/[18 dB]/[21 dB]/[24 dB]/[27 dB]/[30 dB]

### Super Gain

Super Gain allows you to set the gain value to 33 dB or 36 dB.

- Switch to Manual Mode. (→ 43)

**1** Assign <SUPER GAIN> to the desired USER button. (→ 65)

**2** Press the USER button to which <SUPER GAIN> is registered or touch the applicable USER button icon.

- To cancel Super gain, press the USER button or touch the USER button icon again.
- It is also possible to access this function by following the menu path:  
[SW SETUP] → [SUPER GAIN] → [ON]/[OFF]

## ■ To change the gain value of Super Gain

Select the menu.

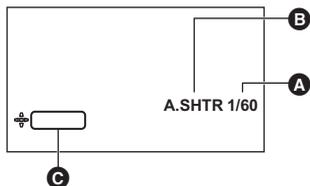
 : [SW SETUP] → [SUPER GAIN EFFECT] → desired setting

[33 dB]/[36 dB]

- Super Gain is not available in the following cases:
  - In Auto Gain Mode

# Manual shutter speed

Adjust the shutter speed when recording fast-moving subjects.



- A** Shutter speed
- B** Auto Shutter display
  - This is displayed in Auto Shutter Mode.
- C** Multi manual icon [SHUTTER]

- Switch to Manual Mode. (→ 43)

## 1 Perform menu setup for [SHUTTER MODE] and set to Manual Shutter Mode.

**MENU** : [SW SETUP] → [SHUTTER MODE] → [MANUAL]

## 2 Confirm that the multi manual icon [SHUTTER] (yellow display: Function Selection Mode) is displayed, and press the SET button.

- Touch the screen if the operation icon is displayed.
- The multi manual icon will change to white. (Function Execution Mode)

## 3 Adjust by pressing the / buttons.

- Press the SET button when the adjustment is completed. The multi manual icon will change to yellow.

### Shutter speed:

The shutter speed varies depending on the frame rate in [REC FORMAT]. (→ 212)

Frame rates	Shutter speed
59.94p/59.94i	1/60.0* ↔ 1/2 ↔ 1/4... ↔ 1/30 ↔ 1/60 ↔ 1/100 ↔ ... 1/8000
29.97p	1/60.0* ↔ 1/2 ↔ 1/4... ↔ 1/50 ↔ 1/60 ↔ 1/100 ↔ ... 1/8000
50.00p/50.00i/25.00p	1/50.0* ↔ 1/2 ↔ 1/3... ↔ 1/25 ↔ 1/50 ↔ 1/60 ↔ ... 1/8000
23.98p	1/48.0* ↔ 1/2 ↔ 1/3... ↔ 1/24 ↔ 1/48 ↔ 1/50 ↔ ... 1/8000

\* Synchro Scan values (→ 59)

- The shutter speed closer to 1/8000 is faster.

## ■ Shutter speed guide for fast moving subjects

Refer to the table below to reduce afterimages that appear when playback is paused.

Subject	Shutter speed
Golf or tennis shot	1/500 to 1/2000
Roller coaster	1/500 to 1/1000

- The shutter speed cannot be adjusted in the following cases:
  - During Freeze Frame (→ 69)
- You may see a band of light around an object that is shining very bright, or highly reflective.
- During normal playback, image movement may not look smooth.
- If you record an extremely bright object or record under indoor lighting, color and screen brightness may change or a horizontal line may appear on the screen. In such cases, change settings as follows:
  - Set this unit to Auto Shutter Mode.
  - Adjust the shutter speed to 1/50, 1/60 or 1/100.
  - Adjust the Synchro Scan setting
- The upper limit value and the lower limit value of the shutter speed can also be set by setting [AUTO SLOW SHUTTER LIMIT], [AUTO SHUTTER LIMIT] during the Auto Shutter Mode. (→ 208, 209)
- The upper limit value for shutter speed is limited during the Infrared Recording Mode.

Frame rates	Upper limit value of the shutter speed
59.94p/59.94i/29.97p	1/60
23.98p	1/48
50.00p/50.00i/25.00p	1/50

- In Auto Iris Mode or Auto Gain Mode, the screen brightness may not change even if you adjust the shutter speed. (→ 54, 56)
- When the shutter speed setting is slow, this unit may not be able to keep up with changes in the image. In such a case, set the iris, focus, and White Balance mode to manual settings.
- If you switch to Playback Mode or turn off the unit with the power button, the unit memorizes the zoom and focus positions, iris and gain values, and shutter speed.
- If you turn off the unit without pressing the power button by, for example, disconnecting the AC adaptor from the AC outlet, the unit will not memorize the current zoom and focus positions, iris/gain value, and shutter speed at that point in time.

## Making adjustments with Synchro Scan

If you press the SET button when the shutter speed is displayed as a decimal number, the Synchro Scan setting will be displayed. You can fine-adjust the shutter speed by adjusting the Synchro Scan setting. This will minimize flickering and horizontal bars in images.

### 1 Switch the shutter speed to decimal display (e.g., 1/60.0), and press the SET button.

- The display on the screen will switch from [SHUTTER] to [SYNCHRO], and the Synchro Scan setting will be displayed.

### 2 Adjust by pressing the ◀ / ▶ buttons.

- To minimize flickering and horizontal bands, look at the screen while adjusting the shutter speed.

### 3 Confirm by pressing the SET button.

- The set shutter speed will also be applied to the [SYNCHRO SCAN] menu setting. (→ 208)

### Shutter speed range for the Synchro Scan setting

Depending on the size and frame rate in [REC FORMAT], the range of available shutter speeds varies. (→ 212)

Frame rates	Shutter speed
59.94p/59.94i	1/60.0 to 1/285.6
29.97p	1/30.0 to 1/206.5
23.98p	1/24.0 to 1/280.1
50.00p/50.00i	1/50.0 to 1/209.2
25.00p	1/25.0 to 1/224.3

# Audio Input

This unit can record audio in 2 ch.

It is possible to switch to the built-in microphone of the camera head, microphone of the SDI output device, external microphone, and connected audio device.

## ■ About audio recording methods

The audio recording method varies depending on the [PRIORITY MODE] setting. (→ 32)

PRIORITY MODE	Audio recording method
REC/PB(4K)	Linear PCM (LPCM)
REC/PB	Dolby Audio

## Switching Audio Input

Audio is recorded with the built-in microphone of the camera recorder during the CAM Mode.

Audio can be recorded by using the microphone of the SDI output device or connecting an external microphone/audio device during the SDI Mode.

### Perform menu setup, and switch the audio input.

MENU : [AUDIO INPUT] → [AUDIO SELECT] → desired setting

(During CAM Mode)

**[INTERNAL MIC]:** Switches the audio input to the built-in microphone of the camera head.  
**[OFF]:** Audio input is not used.

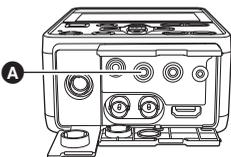
(During SDI Mode)

**[OFF]:** Audio input is not used.  
**[SDI]:** Audio input is switched to the audio of the SDI input.  
**[LINE]:** Audio input is switched to the audio device connected to the MIC/LINE IN terminal.  
**[MIC]:** Audio input is switched to the external microphone connected to the MIC/LINE IN terminal.  
**[Plug-in Power Mic]:** Audio input is switched to the plugin power compatible external microphone connected to the MIC/LINE IN terminal.

- The MIC/LINE IN terminal cannot be used during the CAM Mode.
- If you set [SDI MODE SEL] to [THROUGH] during SDI Mode, [AUDIO SELECT] cannot be set to [LINE], [MIC] or [Plug-in Power Mic].

## ■ Using an external microphone or audio equipment

Connect an external microphone or audio equipment to MIC/LINE IN terminals.



**A** MIC/LINE IN terminal

# Adjusting the audio input level

## Selecting an adjustment method

Adjustment method of the audio input level can be selected.

### 1 Perform menu setup for [AUDIO LEVEL].

MENU : [AUDIO INPUT] → [AUDIO LEVEL] → desired setting

[AUTO]: Adjusts the level automatically.

[MANUAL]: Adjusts the level manually.

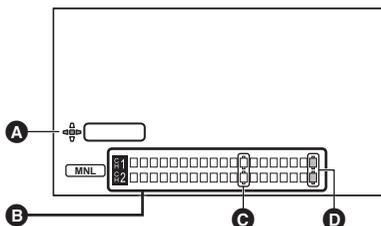
### 2 (If you have set to [MANUAL])

Confirm that the multi manual icon [ MIC VOL] or [ EXT. MIC/LINE VOL] (yellow display: **Function Selection Mode**) is displayed, and press the SET button.

- Touch the screen if the operation icon is displayed.
- The multi manual icon will change to white. (Function Execution Mode)

### 3 Adjust by pressing the / buttons.

- Press the SET button when the adjustment is completed. The multi manual icon will change to yellow.



**A** Multi manual icon [MIC VOL]

**B** Audio level meter

**C** -12 dB

**D** 0 dB

- Adjust confirming the audio level meter.

- Audio level can also be adjusted by pressing the AUDIO MON/ADV – button or the AUDIO MON/ADV + button while pressing and holding the SHIFT button. (→ 76)
- [AUDIO LEVEL] setup cannot be changed when [AUDIO SELECT] is set to [OFF] or [SDI].

## Using the ALC function

Distortion of sound can be decreased by setting ALC.

### 1 Set [AUDIO LEVEL] to [MANUAL].

### 2 Select the menu.

MENU : [AUDIO INPUT] → [AUDIO ALC] → desired setting

[ON]: Enables ALC, allowing you to record audio with reduced noise.

[OFF]: Allows you to record natural-sounding audio.

- In the following cases, [AUDIO ALC] will be set to [ON], and the setup cannot be changed.
  - When [AUDIO SELECT] is set to [OFF] or [SDI]
  - When [AUDIO LEVEL] is set to [AUTO]

# Counter display

You can change a counter display that indicates how much time has elapsed during recording or playback.

**Switch the counter display by pressing the USER button assigned as <COUNTER>, or touching the USER button icon.**

- Please refer to page 65 for details about setting the USER button.
- The display will be switched in the following order: TC → UB\* → Recording Counter → Off.

Counter display	Indications
<b>TC (Time Code)</b>	TC 00:00:00:00 or TC 00:00:00.00 <ul style="list-style-type: none"> <li>• Display will change depending on the setting of the [DF MODE]. (→ 63)</li> </ul>
<b>UB (User Information)* (→ 64)</b>	UB 00 00 00 00
<b>REC COUNTER (Recording Counter) (→ 64)</b>	(In Recording Mode) 0:00:00 or CLP 0:00:00 (In Playback Mode) CLP 0:00:00 <ul style="list-style-type: none"> <li>• The display format used in Recording Mode is determined by the [REC COUNTER] setting.</li> <li>• In Playback Mode, the counter is reset to [CLP 0:00:00] for every clip.</li> </ul>

\* This is displayed only when [PRIORITY MODE] is set to [REC/PB] or [IP]. (→ 32)

- It is also possible to switch the counter display by the menu setup.  
[DISP SETUP] → [COUNTER]

## Setting the Time Code CAM SDI

Time code will display the recording time in hours, minutes, seconds, and frames.

**TC 00:00:00:00 (hour: minute: second: frame [NDF])**

**TC 00:00:00.00 (hour: minute: second. frame [DF])**

- The number of frames (frame count per second) varies depending on the frame rate in [REC FORMAT]. (→ 212)

Frame rates	Frame
59.94p/59.94i/29.97p	0 to 29
50.00p/50.00i/25.00p	0 to 24
23.98p	0 to 23

## [DF MODE]

Select the compensation mode for the time code.

- Set [SYSTEM FREQ] to [59.94Hz]. (→ 40)

Select the menu.

 : [TC/UB SETUP] → [DF MODE] → desired setting

[DF]: Time code is compensated in accordance with the actual time. It is mainly used for broadcasting such as TV programs.

[NDF]: It will not compensate the time code. (There will be a difference from the actual time)

- This item will be set to [NDF] automatically in following cases:
  - When the frame rate in [REC FORMAT] is 23.98p (→ 212)
- This item will be automatically set to [NDF] and will not be displayed as a menu item when [SYSTEM FREQ] is set to [50.00Hz]. (→ 40)

## [TCG]

Sets the way the time code will move.

Select the menu.

 : [TC/UB SETUP] → [TCG] → desired setting

[FREE RUN]\*: It will constantly move.

[REC RUN]: It will move only when recording.

- \* If the frame rate in [REC FORMAT] or is set to 23.98p, a slight time error may occur when switching to Playback Mode. (→ 212)
- It is automatically set to [FREE RUN] in following cases:
  - When PRE-REC is enabled (→ 70, 214)

- The time code will reset when the built-in lithium battery is exhausted when it is set to [FREE RUN].

## [TC PRESET]

You can set the initial time code.

**1** Select the menu.

 : [TC/UB SETUP] → [TC PRESET]

**2** Touch the item to set and change with  / .

- The display will be set to "00h00m00s00f" if you touch [Reset].
- "h" is an abbreviation for hour, "m" for minute, "s" for second and "f" for frame.

**3** Touch [EXIT] to complete the setting.

- This unit will adjust the time code in accordance with the frame rate of the [REC FORMAT] (→ 212). Therefore, it may not be continuous from the previous final time code when the recording format is changed.
- Counting may not continue from the previous final time code when the Operation Mode is switched from SDI Mode to CAM Mode.
- If the frame rate in [REC FORMAT] is set to 23.98p, set the number of frames to [00] or a multiple of 4. If you enter a different value, time code will not be recorded correctly.

## Setting the User Information CAM SDI

Eight digit hexadecimal alphanumeric can be entered and displayed as a memo information such as dates, control numbers, etc., into the User Information.

**UB 00 00 00 00**

- This is displayed only when [PRIORITY MODE] is set to [REC/PB] or [IP]. (→ 32)

### [UB PRESET]

You can set the User Information.

- Set [PRIORITY MODE] to [REC/PB] or [IP]. (→ 32)

#### 1 Select the menu.

 : [TC/UB SETUP] → [UB PRESET]

#### 2 Touch the item to set and change with / .

- You can use numbers from 0 to 9 and letters from A to F.
- It will be set to "00 00 00 00" when [Reset] is touched.

#### 3 Touch [EXIT] to complete the setting.

- When [PRIORITY MODE] is set to [IP(4K)] or [REC/PB(4K)], the [UB PRESET] setting can be changed, but the changed setting cannot be used.

## Setting the Recording Counter CAM SDI

Recording Counter will display the recording time in seconds.

**0:00:00 (hour : minute : second (When [REC COUNTER] is set to [TOTAL]))**

**CLP 0:00:00 (hour : minute : second (When [REC COUNTER] is set to [CLIP]))**

### [REC COUNTER]

Select the counting method during the recording.

Select the menu.

 : [DISP SETUP] → [REC COUNTER] → desired setting

**[TOTAL]:** The count continues to increase until the Recording Counter is reset.

**[CLIP]:** Resets the Recording Counter at start of recording. Counts the time of each recording session.

#### **To reset the Recording Counter for the Recording Mode**

Recording counter will be set to "0:00:00" when the USER button assigned as <RESET> is pressed or the USER icon is touched while displaying the counter.

- Please refer to page 65 for details about setting the USER button.

## Using the TC data of the SDI output device SDI

The values of the time code and the users bit to be recorded in the SDI Mode can be selected by setting [SDI REGEN].

Select the menu.

 : [TC/UB SETUP] → [SDI REGEN]

**[ON]:** Records the value of S-LTC area of the camera recorder connected to the SDI IN terminal.

**[OFF]:** Records the built-in time code and users bit.

- The following occurs if you select [ON].
  - Setups for [TC PRESET] and [UB PRESET] will not be able to change.
  - The built-in time code (free run) and users bit will be recorded if it is not possible to receive the TC data due to mismatched format, no input data, etc.

Recording

## USER button

Each of the USER button can register one function from the 29 available functions.

- The USER buttons consist of the USER button (USER1) on this unit and 12 USER button icons displayed in the LCD monitor (USER2 to 13).

## Setting the USER button

**1** Select the menu.

 : [USER SW] → [USER1] to [USER13]

- It is not possible to register functions to [USER2] to [USER13] in Playback Mode.

**2** Touch the item to register.

- For the functions of the USER button that can be registered, refer to page 67.
- Touch <INHIBIT> if not registering.
- Next (Previous) page can be displayed by touching  / .

**3** Touch [EXIT] to complete the setting.

- The tables below show the default settings.

<b>USER1 button</b>	<REC CHECK>
<b>USER2 button</b>	<DISP/MODE CHK>
<b>USER3 button</b>	<FRZ FRAME>

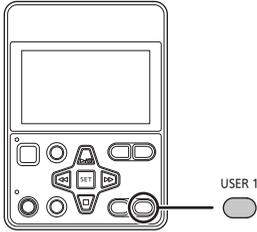
<b>USER4 button</b>	<BACKLIGHT>
<b>USER5 button</b>	<MENU>
<b>USER6 to 13 buttons</b>	<INHIBIT>

- <LCD OFF> can only be assigned to [USER1].
- <ZOOM W> and <ZOOM T> can be assigned to any buttons from [USER2] to [USER13].
- Performing [ALL] in [INITIAL SET] restores these default settings. (→ 228)

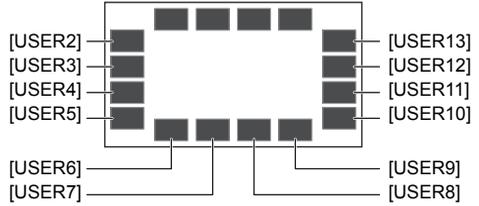
# Using the USER button

Either press the set USER1 button or touch the USER 2 to 13 USER button icons while the operation icons are displayed.

(When you use the USER1 button)



(When you use the USER2 to USER13 button)



- The USER button icon (USER2 to 13) assigned as <INHIBIT> is not displayed in the screen.
- To cancel, press the USER button or touch the USER button icon again.  
For canceling or using of the following functions for the USER buttons, refer to each page.
  - <REC CHECK> (→ 71)
  - <LAST CLIP DEL> (→ 71)
  - <ZEBRA> (→ 72)
  - <SCENE FILE> (→ 70)
  - <REMOTE REC> (→ 71)
  - <D.ZOOM> (→ 68)

(When using USER2 to 13 buttons)

- If the screen is touched while the operation icons are displayed, or if there is no touch operation for a period of time, the operation icons will disappear. To display again, touch the screen.
- The display duration of operation icons can be changed in [OPERATION ICONS DISPLAY]. (→ 225)

## Switch display/not-display of the USER buttons

Display/not-display of the USER button icons in the LCD monitor can be switched.

Select the menu.



## Check the setting of the USER buttons

To confirm the setup of the USER1 button, press and hold the USER button assigned as <DISP/MODE CHK>, or touch and hold the USER button icon to display the Mode information display. (→ 74)

# Functions of the USER button

## ■ List of USER button functions

Item	Icon	Function	Mode that can be used	
			CAM Mode	SDI Mode
<INHIBIT>	—	Invalid	○	○
<ATW LOCK>	[ATW.L]	ATW Lock	○	—
<BACKLIGHT>	[B.Light]	Backlight Compensation	○	—
<SPOTLIGHT>	[S.Light]	Spotlight Compensation	○	—
<D.ZOOM>	[D.ZM]	Digital Zoom	○	—
<DRS>	[DRS]	DRS <sup>*</sup>	○	—
<SUPER GAIN>	[S.Gain]	Super Gain <sup>*</sup>	○	—
<FRZ FRAME>	[FRZ]	Freeze Frame	○	—
<IR REC>	[IR REC]	Infrared Recording	○	—
<SCENE FILE>	[SCN FILE]	Scene File	○	—
<PRE-REC>	[PRE-REC]	PRE-REC	○	○
<REC CHECK>	[REC.C]	Recording Check	○	○
<LAST CLIP DEL>	[LstDel]	Deletion of the last clip	○	○
<REMOTE REC>	[Remo.Rec]	REMOTE REC	○	○
<O.I.S.>	[O.I.S.]	Image stabilization	○	—
<ZEBRA>	[ZEBRA]	Zebra	○	—
<BARS>	[BARS]	Color bar	○	○
<COUNTER>	[COUNT]	Counter	○	○
<RESET>	[RESET]	RESET	○	○
<LCD DETAIL>	[DETAIL]	LCD detail	○	○
<DISP/MODE CHK>	[DISP/MODE]	DISP/MODE CHK	○	○
<LCD REVERSE>	[LCD Rev.]	LCD reverse	○	○
<ZOOM W>	[W]	Zoom out	○	—
<ZOOM T>	[T]	Zoom in	○	—
<SLOT SEL>	[SlotSel]	Slot Selection	○	○
<FA>	[FA]	Focus Assist	○	—
<PUSH AUTO>	[PushAuto]	Push auto	○	—
<WFM>	[WFM]	Waveform display	○	○
<MENU>	[MENU]	Menu	○	○
<LCD OFF>	—	Turn off LCD monitor	○	○

“○”: Available; “—”: Not available

\* Not available in Auto Mode

- If you press a USER button that cannot be used in SDI Mode, [INVALID] is displayed on the screen.
- The USER button function can also be set from the following menu item.
  - [BACKLIGHT COMPENS.] (→ 207)
  - [SPOTLIGHT COMPENS.] (→ 207)
  - [D.ZOOM] (→ 209)
  - [DRS] (→ 206)
  - [SUPER GAIN] (→ 207)
  - [INFRARED REC] (→ 210)
  - [SCENE FILE] (→ 220)
  - [PRE-REC] (→ 214)
  - [O.I.S.] (→ 210)
  - [ZEBRA] (→ 222)
  - [COLOR BARS] (→ 223)
  - [COUNTER] (→ 221)
  - [LCD DETAIL] (→ 225)
  - [LCD REVERSE] (→ 225)
  - [FOCUS ASSIST] (→ 221)
  - [WFM] (→ 222)

## <ATW LOCK>

CAM

- Register <ATW LOCK> to a USER button. (→ 65)

This sets the White Balance mode to [ATW LOCK]. (→ 53)

## <BACKLIGHT>

CAM

- Register <BACKLIGHT> to a USER button. (→ 65)
- Set to Auto Mode (→ 43) or set one of [IRIS MODE], [GAIN MODE] or [SHUTTER MODE] to [AUTO] (→ 207, 208)

Switches to automatic control to compensate the backlight.

This makes the image brighter to prevent darkening of a backlit subject. (→ 55)

## <SPOTLIGHT>

CAM

- Register <SPOTLIGHT> to a USER button. (→ 65)
- Set to Auto Mode (→ 43) or set one of [IRIS MODE], [GAIN MODE] or [SHUTTER MODE] to [AUTO] (→ 207, 208)

Switches to automatic control for spotlight.

Very bright object is recorded clearly. (→ 55)

## <D.ZOOM>

CAM

- Register <D.ZOOM> to a USER button. (→ 65)

Uses the digital zoom.

### ■ To change the zoom magnification of Digital Zoom

The zoom magnification of Digital Zoom varies depending on the [D.ZOOM RATIO] setting.

 : [SW SETUP] → [D.ZOOM RATIO] → desired setting

[×1.4] (1.4×)/[×2] (2×)/[×4] (4×)/[×6] (6×)/[×8] (8×)

- When using Digital Zoom, the larger you set the zoom magnification, the lower the picture quality becomes.
- Digital Zoom is not possible in following cases:
  - During Freeze Frame (→ 69)
- This function is canceled when the unit is turned off.

## <DRS>

CAM

- Register <DRS> to a USER button. (→ 65)

Switches the on/off of the DRS (Dynamic Range Stretcher) function.

It is possible to expand the dynamic range by compressing the video signal level of the highly illuminated area that gets washed out with standard recording.

- If this item is switched on, the previous setup value of the [DRS] menu (one of [LOW]/[MID]/[HIGH]) will be set. (→ 206)

## <SUPER GAIN>

CAM

- Register <SUPER GAIN> to a USER button. (→ 65)
- Switch to Manual Mode. (→ 43)

This changes the gain value to a [SUPER GAIN EFFECT] value. (→ 57)

- **Register <FRZ FRAME> to a USER button. (→ 65)**

Freezes the image on the unit.

- [Freeze] will appear on the screen and flash.

- If you record a motion picture during Freeze Frame, the frozen image and sounds will be recorded.
- This function is not available in the following cases:
  - When using Focus Assist (→ 51)
  - When color bars are displayed (→ 73)
- Freeze Frame is canceled if you operate this unit in any of the following ways:
  - Turning off the unit
  - Pressing the MODE button
  - Changing the [PRIORITY MODE] or [REC FORMAT] setting

- **Register <IR REC> to a USER button. (→ 65)**

This changes the Infrared Recording Mode setting.

- This unit operates as follows in Infrared Recording Mode:
  -  appears on the screen.
  - The iris will be forced to OPEN and the upper limit value for shutter speed will be limited.

- It is recommended to use a tripod.
- It takes longer to focus with Auto Focus in dark locations.
- Do not use this function in a bright location. Doing so may cause malfunction.
- You can record a clear image by positioning the center area of the screen over the subject.
- Focus values may not be displayed correctly in Infrared Recording Mode. (→ 48)
- The following menu items are not available in Infrared Recording Mode:
 

– [SKIN TONE DTL] (→ 202)	– [COLOR CORRECTION SETTING] (→ 204)
– [WB R GAIN] (→ 202)	– [BACKLIGHT COMPENS.] (→ 55, 207)
– [WB B GAIN] (→ 202)	– [SPOTLIGHT COMPENS.] (→ 55, 207)
– [CHROMA LEVEL] (→ 203)	– [VAR] (→ 209)
– [CHROMA PHASE] (→ 203)	– [SCENE FILE] (→ 70, 220)
– [MATRIX] (→ 203)	
- The following functions are not available in Infrared Recording Mode:
 

– Change the White Balance mode (→ 52)	– ND filter (→ 80)
– Iris adjustment (→ 54)	– ATW Lock (→ 53)
– Synchro Scan (→ 59)	– Super Gain (→ 57)
- It is also possible to change the color in which images are recorded in [IR REC COLOR] (→ 210)
- If [FOCUS] is set to [MANUAL], depending on the recording conditions, the subject may go out of focus when you switch to Infrared Recording Mode. Adjust the focus as needed or set [FOCUS] to [AUTO].
- Night-time recording requires a commercially-available IR LED illuminator. We recommend using an IR LED illuminator with a wavelength of approximately 850 nm.

- Register <SCENE FILE> to a USER button. (→ 65)

You can save the scene file settings to the SD card or load them from the SD card to this unit.

### ■ Saving scene file settings

- 1 Press USER button or touch USER button icon in the recording screen.
- 2 Touch [SAVE].
- 3 Touch the name of the scene file.

- All scene number settings ([AUTO], [F1:], [F3:]) will be saved.
- Up to 8 files can be saved.
- If you have touched the name of the existing scene file, touch [YES] to overwrite it.

### ■ Assigning saved scene files to scene numbers

- 1 Press USER button or touch USER button icon in the recording screen.
- 2 Touch [LOAD].
- 3 Touch the name of the scene file you want to load.
- 4 Touch ▲ / ▼ to select the scene number to which you want to assign the scene file.
- 5 Touch [RETURN].

- When you touch [YES], Settings\* of the scene number you have selected will be loaded and then assigned to the corresponding scene number in [SELECT SCENE].

\* The title of the scene number will also be loaded.

- If you select [ALL], settings of all scene numbers will be loaded.

- 
- You can also access this function by selecting menu items.  
[CARD FUNCTION] → [SCENE FILE] → [LOAD] or [SAVE]

- Register <PRE-REC> to a USER button. (→ 65)

This allows the recording of an image and audio to start before you press the recording REC/PAUSE button. AVCHD clips will record from approximately 3 seconds before, and MP4 clips will record from approximately 4 seconds before.

- [P-] is displayed on the screen. After you start recording, the display changes to [P-REC].

- Aim the unit at the subject beforehand.

- This cannot be set when [PRIORITY MODE] is set to [IP] or [IP(4K)].
- AVCHD clips may not record from 3 seconds before, or MP4 clips may not record from 4 seconds before in the following cases.
  - Immediately after the maximum PRE-REC standby time has elapsed\*
  - If the length of time from when PRE-REC is set to [ON] to when you start recording is too short
  - If the length of time from when you display the recording screen by turning it off and on or pressing the MODE button to when you start recording is too short since you set PRE-REC
  - When the card slot to record the image was switched automatically by RELAY REC operating at the time the recording was started (→ 42)

\* The maximum PRE-REC standby time is 3 hours. Once PRE-REC is activated, it is automatically deactivated and then re-activated every 3 hours.

- Images displayed on the thumbnail in Playback Mode will differ from the motion pictures displayed at the start of playback.
- PRE-REC is canceled when [AUTO REC INPUT] is set to anything other than [OFF]. (→ 81)

## <REC CHECK>

CAM

SDI

- Register <REC CHECK> to a USER button. (→ 65)

Approximately 3 seconds at the last of the clip recorded last can be played back. It will return to the recording screen once the playback is completed.

- 
- The time code is not displayed during REC check.
  - This does not operate during REC check even if the button is operated.
  - Recording Check is not possible in following cases:
    - When the unit is turned on/off
    - When the MODE button is pressed
    - When the SD card is inserted/removed
    - When the setting of [REC FORMAT] is changed (→ 212)
    - PRE-REC is used (→ 70, 214)
    - During Freeze Frame (→ 69)

## <LAST CLIP DEL>

CAM

SDI

- Register <LAST CLIP DEL> to a USER button. (→ 65)

The clip recorded last can be deleted.

**Deleted clips cannot be restored.**

- 1 Press USER button or touch USER button icon in the recording screen.

- 2 Touch [YES].

- It will return to recording screen without deleting by touching [NO].

- 
- Deletion is not possible in the following cases.
    - When the unit is turned on/off
    - When the MODE button is pressed
    - When the SD card is inserted/removed
    - When the setting of [REC FORMAT] is changed (→ 212)

## <REMOTE REC>

CAM

SDI

- Register <REMOTE REC> to a USER button. (→ 65)

This controls recording performed with an external device (recorder, etc.) connected to the unit.

- Set [SDI MODE SEL] to [NORMAL]. (→ 94)

- 1 Select the appropriate option in the [OUTPUT SEL] menu.

 : [OUTPUT SETUP] → [OUTPUT SEL] → [SDI]

- 2 Select the [SDI REMOTE REC] menu.

 : [OUTPUT SETUP] → [SDI REMOTE REC] → [TYPE3]

- 3 Select the [SDI REMOTE REC LINK] menu.

 : [OUTPUT SETUP] → [SDI REMOTE REC LINK] → [OFF]

- 4 Press USER button or touch USER button icon in the recording screen.

- This will display SDI ● and send a signal to the external device instructing it to start recording.
- To stop recording to the external device, press the applicable USER button or touch the applicable USER button icon again. This will display SDI III and send a signal to the external device instructing it to stop recording.

- 
- It is not possible to control recording performed with an external device connected to the SDI OUT terminal in the following cases:
    - When [SDI MODE SEL] is set to [THROUGH]

- Register <O.I.S.> to a USER button. (→ 65)

Switches the on/off of the image stabilization. (→ 47)

- Register <ZEBRA> to a USER button. (→ 65)

Parts where white saturation (color saturation) is likely to occur (extremely brightly lit or shiny parts) are displayed with diagonal lines (zebra pattern **A**).

**Press USER button or touch USER button icon in the recording screen.**

It will switch between the zebra display every time the button is pressed.

Zebra 1 → Zebra 2 → setting canceled

\* It is not displayed when the [ZEBRA DETECT 2] is set to [OFF]. (→ 223)

(When Zebra 1 is set)



- This function is not available in the following cases:

- When [WFM] is set to [ON] (→ 77, 222)
- During Freeze Frame (→ 69)

- You can record an image with little white saturation if you manually adjust the shutter speed or brightness not to display zebra pattern. (→ 54, 58)

- The zebra pattern does not appear on the images actually recorded.

- It is also possible to adjust the level of the zebra pattern to be displayed. (→ 223)

- It is also possible to change the [ZEBRA MODE] setting to change the display time for the zebra pattern display. (→ 222)

## <BARS>

CAM

SDI

- Register <BARS> to a USER button. (→ 65)

The color bar convenient for picture quality adjustment of the external monitor can be displayed.

- Test tones can be output as audio signals from the headphone terminal or either of the external output terminals while color bars are displayed.  
It will not be output from the speaker of this unit.
- Different color bars are displayed depending on the [BARS TYPE] setting. (→ 223)
- The frequency of a test tone that is output when color bars are displayed differs depending on the setting of the following items:
  - [SYSTEM FREQ] (→ 40)
  - Frame rate in [REC FORMAT] (→ 212)

System Frequency setting	Frame rates	Test tone frequency
59.94Hz	All frame rates	1 kHz
50.00Hz	50.00p/50.00i/25.00p	997 Hz

- The test tone volume differs depending on the [TEST TONE] setting. (→ 220)

- This function is canceled when the unit is turned off.
- You can record color bars as motion pictures.
- If you press the USER button while recording color bars as a motion picture, you can stop displaying the color bars.  
To display them again, stop the recording and press the USER button.
- To output the color bar from the SDI OUT terminal, set [SDI MODE SEL] to [NORMAL].
- This item cannot be set during Freeze Frame. (→ 69)
- Color bars can be displayed and recorded during SDI Mode even when there is no SDI input.
- If you display color bars while an error message about SDI input is displayed on the unit's screen, built-in color bars will appear. (→ 95)
- While built-in color bars are displayed, input information (TC/UB, etc.) will be provided by the unit.  
Test tones can be output as audio signals.
- If you cancel the color bar display and stop recording, built-in color bars will disappear and the unit will switch to SDI Mode.
- When an SDI signal is input to the unit while built-in color bars are displayed, genlock will be applied (the unit will stop and then restart recording if this occurs during recording). However, the color bars will remain displayed. The SDI input screen will appear after the color bar display is canceled.
- To output color bars to the SDI OUT terminal, set [SDI MODE SEL] to [NORMAL]. (→ 94)

## <COUNTER>

CAM

SDI



- Register <COUNTER> to a USER button. (→ 65)

The counter display can be switched. (→ 62)

## <RESET>

CAM

SDI

- Register <RESET> to a USER button. (→ 65)

The display of the recording time counter can be reset. (→ 64)

## <LCD DETAIL>

CAM

SDI

- Register <LCD DETAIL> to a USER button. (→ 65)

The outline of the LCD monitor image is enhanced, making it easier to focus. (→ 49)

- These settings will not affect the images actually recorded.

- Register <DISP/MODE CHK> to a USER button. (→ 65)

The screen display can be switched, and the information screen can be displayed.

### ■ Switching screen display

Press USER button or touch USER button icon in the recording screen.

Simplified display ↔ Normal display

- The screen display other than the counter display, time stamp, zebra display, and safety zone are erased in the simplified display. (→ 231)

### ■ Displaying mode information

The Mode information display is displayed when the USER button is pressed and held in the recording screen. The display switches in the following order every time the USER button is pressed.

Mode information display1 → Mode information display2 → Mode information display3 →

Mode information display4 → Normal display

<b>Mode information display1:</b>	<ul style="list-style-type: none"> <li>● The following items are displayed.           <ul style="list-style-type: none"> <li>– [USER1]: The function assigned to the USER1 button</li> <li>– [IMAGE INPUT]: Type of the input device</li> <li>– [PRIORITY MODE]: Setup content of [PRIORITY MODE]</li> <li>– [AWB A]: Setup status of the White Balance mode [AWB A] (Ach)</li> <li>– [AWB B]: Setup status of the White Balance mode [AWB B] (Bch)</li> <li>– [MIC]: Setup content of [AUDIO SELECT]</li> </ul> </li> </ul>
<b>Mode information display2:</b>	<ul style="list-style-type: none"> <li>● Displays the title given to each scene number of a scene file.</li> </ul>
<b>Mode information display3:</b>	<ul style="list-style-type: none"> <li>● The function for the button pressed simultaneously with the SHIFT button is displayed. For details of the function, refer to page 76.</li> </ul>
<b>Mode information display4:</b>	

- Regardless of the [OPERATION ICONS DISPLAY] setting (→ 225), the USER button icons are displayed for about 5 seconds while the Mode information display is shown.

## <LCD REVERSE>

CAM

SDI

- Register <LCD REVERSE> to a USER button. (→ 65)

The LCD monitor can be displayed reversed vertically and horizontally. (→ 38)

## <ZOOM W>/<ZOOM T>

CAM

- Assign <ZOOM W> or <ZOOM T> to one of the USER buttons. (→ 65)

Performs the zoom operation. (→ 46)

## <SLOT SEL>

CAM

SDI



- Register <SLOT SEL> to a USER button. (→ 65)

You can change the card slot used for motion picture recording or the playback media.

- You can change the setting in the following situations:
  - While recording is paused in Recording Mode
  - While a thumbnail screen is displayed in Playback Mode (→ 83)
  - While the list by date is selected (→ 88)

## <FA>

CAM

- Register <FA> to a USER button. (→ 65)

Sets the Focus Assist function. (→ 51)

## <PUSH AUTO>

CAM

- Register <PUSH AUTO> to a USER button. (→ 65)

PUSH AUTO function can be used. (→ 50)

## <WFM>

CAM

SDI

- Register <WFM> to a USER button. (→ 65)

The waveform display (WFM) can be switched. (→ 77)

## <MENU>

CAM

SDI



- Register <MENU> to a USER button. (→ 65)

The menu can be displayed.

## <LCD OFF>

CAM

SDI



- Register <LCD OFF> to a USER1 button. (→ 65)

On/off of the LCD monitor can be switched.

# Useful functions

## Using the SHIFT button CAM SDI

Useful recording and shooting functions can be used by pressing designated buttons while pressing and holding the SHIFT button.

- Operation is not possible when the menu screen is displayed, except for the operation of turning on/off the LCD monitor.  
Perform the operation after closing the menu screen.

Buttons pressed at the same time as the SHIFT button	Function	Usable modes	
		CAM Mode	SDI Mode
AUDIO MON/ADV – button	Reduces the input level of audio (→ 61)	○	○
AUDIO MON/ADV + button	Increases the input level of audio (→ 61)	○	○
SET button (press and hold)	Lock the button operations or cancel the setting	○	○
	Display the focus assist (→ 51)	○	–
	Display the wave form (→ 77)	○	○
	Using the PUSH AUTO function (→ 50)	○	–
 (short press)	Perform Auto White Balance (→ 53)	○	–
 (press and hold)	Perform both the Auto Black Balance/Auto White Balance (→ 53)	○	–
USER1 button	Switching on/off of the LCD monitor	○	○

## Lock or clear button operations CAM SDI

The operation buttons can be disabled temporarily to prevent accidental operation.

### Press and hold the SET button for 2 seconds or longer while pressing and holding the SHIFT button.

- All the button operations become disabled.
  - This is canceled by pressing and holding again for 2 seconds or longer.
  - The lock setup is canceled when the unit is turned off.
  -  (yellow) is displayed in the LCD monitor while the operations are locked.
- 
- The following operations are enabled even while the operations are locked.
    - Recording and zoom operation with the wired remote control (optional) connected to the CAM REMOTE terminal.
    - Operation from the Web screen of the remote camera controller, PC, or mobile terminal connected via network.

The waveform display (WFM) can be switched.

**Press the  button while pressing and holding the SHIFT button in the recording screen.**

- When [WFM TYPE] is set to [WAVE] or [VECTOR], each press of the button enables/disables WFM.
- When [WFM TYPE] is set to [WAVE/VECTOR], each press of the button switches the setting.  
WAVE (wave display) → VECTOR (vector display) → Off

- WFM can also be switched by performing the menu setup for [WFM] or pressing the USER button assigned as <WFM>. (→ 65, 222)
- WFM is not displayed on the external monitor.
- While WFM is displayed, information displayed on the unit's LCD monitor screen and the external output device's monitor screen will be hidden. To display the information again, perform one of the following operations to turn off the WFM function.
  - Press the  button while pressing and holding the SHIFT button.
  - Set the [WFM] menu to [OFF] (→ 222).
  - Press the USER1 button assigned as <WFM>.
- This function is not available in the following cases:
  - When using Focus Assist (→ 51)
  - During Freeze Frame (→ 69)
  - When color bars are displayed. (→ 73)
- [WFM] will be canceled in the following cases:
  - If you turn the unit off
  - If you press the MODE button

## ■ To change the type of WFM

Select the menu.

 : [DISP SETUP] → [WFM TYPE] → desired setting
[WAVE]: Displays waveforms as waves.
[VECTOR]: Displays waveforms as vectors.
[WAVE/VECTOR]: Switches the setting each time the applicable USER button is pressed.

- This function is not available in the following cases:
  - When using Focus Assist (→ 51)
  - During Freeze Frame (→ 69)
  - When color bars are displayed (→ 73)

## ■ To change the display position of WFM

Select the menu.

 : [DISP SETUP] → [WFM POSITION] → desired setting
[TOP/LEFT]/[TOP/RIGHT]/[BOTTOM/LEFT]/[BOTTOM/RIGHT]

- You can also change the waveform position to the upper left, upper right, bottom left or bottom right by performing one of the following operations while a waveform is displayed:
  - Press the  /  buttons
  - Sliding the waveform while touching it.

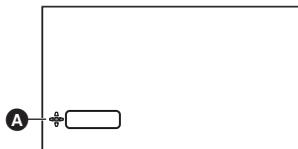
Press the **USER1** button while pressing and holding the **SHIFT** button.

- The LCD monitor is turned off. It is turned on by pressing the same button again.
- The setup is canceled when the unit is turned off.
- Buttons can be operated even while the LCD monitor is turned off.
- The LCD monitor can also be switched on/off by pressing the USER1 button assigned as <LCD OFF>. (→ 65)

## Using the multi manual function

The multi manual function allow you to select various functions and adjust various settings by operating the SET button and the ◀ / ▶ buttons.

You can also switch between the functions and adjust their settings.



A Multi manual icon [FOCUS]

(When the recording screen is displayed)

Multi manual icon	Function	Usable modes	
		CAM Mode	SDI Mode
☒ ICONS	Allows you to display/select operation icons on the recording screen.	○	○
☒ FOCUS	Adjusting the focus value (→ 48)	○	—
☒ WB	Changing the White Balance mode, adjusting VAR (→ 52, 53)	○	—
☒ AE LEVEL	Adjusting AE level (→ 55)	○	—
☒ SHUTTER	Adjusts the shutter speed. (→ 58)	○	—
☒ IRIS	Adjusts the iris value. (→ 54)	○	—
☒ GAIN	Adjusts the gain value. (→ 56)	○	—
☒ ND FILTER	Switching the ND filter (→ 80)	○	—
☒ MIC VOL	Adjusting the audio for built-in microphone input (→ 61)	○	—
☒ EXT. MIC/LINE VOL	Adjusting the audio for external microphone input (→ 61)	—	○
☒ VOL	Headphone Volume Adjustment (→ 81)	○	○

## To switch the function set in the recording screen

### 1 Set so the function to be used can be selected.

- If the desired function cannot be selected, use the settings below.

Functions	Settings
 FOCUS	—
 AE LEVEL	Set [SELECT SCENE] to [AUTO] or set [IRIS MODE], [GAIN MODE] or [SHUTTER MODE] to [AUTO]
 SHUTTER	Set [SHUTTER MODE] to [MANUAL]
 IRIS	Set [SELECT SCENE] to a setting other than [AUTO] and set [IRIS MODE] to [MANUAL].
 GAIN	Set [SELECT SCENE] to a setting other than [AUTO] and set [GAIN MODE] to [MANUAL].
 MIC VOL	Set [AUDIO SELECT] to [INTERNAL MIC] and set [AUDIO LEVEL] to [MANUAL]
 EXT. MIC/LINE VOL	Set [AUDIO SELECT] to [MIC], [LINE] or [Plug-in Power Mic] and set [AUDIO LEVEL] to [MANUAL]
 VOL	Connect headphones to this unit.

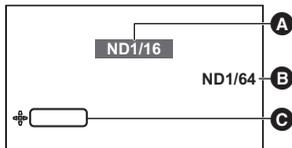
### 2 Switch the multi manual icon (yellow display: Function Selection Mode) by pressing the / buttons in the recording screen.

### 3 Press the SET button.

- The multi manual icon for the selected function will change to white. (Function Execution Mode)  
The operation icon can be selected when [ [CONS]] is selected. (→ 43)
- Adjustment of the selected function is possible by pressing the  /  buttons.

The built-in optical ND filter (light intensity adjustment filter) can be switched.

- Use this when recording in sunny outdoor when the subject is too bright and the screen becomes washed out.



- A** Recommended ND filter setting
- B** ND filter setting
- C** Multi manual icon [ND FILTER]

- 1 Switch to multi manual icon [ND FILTER] (yellow display: Function Selection Mode) by pressing the  $\leftarrow$  /  $\rightarrow$  buttons in the recording screen.**
- 2 Press the SET button.**
  - The multi manual icon will change to white. (Function Execution Mode)
- 3 Press the  $\leftarrow$  /  $\rightarrow$  buttons to switch the ND filter.**

<b>[ND1/64]:</b>	Reduces the amount of light to 1/64.
<b>[ND1/16]:</b>	Reduces the amount of light to 1/16.
<b>[ND1/4]:</b>	Reduces the amount of light to 1/4.
<b>[CLEAR]:</b>	Does not use the ND filter.

- 4 Press the SET button to complete the setup.**
    - If the selected setting [ND1/64], [ND1/16] or [ND1/4] does not match an ND filter setting recommended by this unit, the recommended setting will be displayed on the screen, blink for approximately 5 seconds and disappear.
- 
- A recommend ND filter setting may not be displayed correctly in scenes that are too dark.
  - The brightness may change drastically when the ND filter is changed.

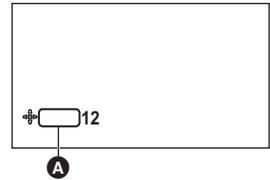
## Headphone Volume Adjustment

CAM

SDI

Adjust the volume of the headphone while recording.

- 1 **Connect the headphone to the headphone output terminal.**
  - 2 **Press the**  **/**  **buttons to adjust the volume.**
- Actual volume to be recorded does not change.
- 3 **Press the SET button to complete the setup.**



**A** [VOL]

## AUTO REC function CAM SDI

Recording control of this unit from the SDI output device or recording control of the external device (such as recorder) from this unit can be performed with the AUTO REC signal.

### AUTO REC input

This unit can automatically start/stop recording following the AUTO REC signal input from the camera recorder connected to the SDI IN terminal.

- For information about supported devices, refer to the support desk section of the website below.  
<https://pro-av.panasonic.net/>

Select the menu.

 : [RECORD SETUP] → [AUTO REC INPUT] → desired setting

[OFF]: Does not start/stop recording automatically.  
[TYPE1]: Starts/stops recording automatically following the TYPE1 information added to HD-SDI.  
[TYPE2]: Starts/stops recording automatically following the TYPE2 information added to HD-SDI.  
[TYPE3]: Starts/stops recording automatically following the TYPE3 information added to HD-SDI.

- The input and recording may not match when the interval between start/stop times is small (1 second or less), or when the input signal is disrupted.
- To set to anything other than [OFF], always turn on this unit and connect to a camera recorder in the recording pause status.

### AUTO REC output

Recording control of the external device (such as recorder) connected to the SDI OUT terminal can be performed by outputting the AUTO REC signal.

#### ■ Set the AUTO REC output of this unit

Set [SDI REMOTE REC] to switch the setup of AUTO REC signal output from this unit.

Select the menu.

 : [OUTPUT SETUP] → [SDI REMOTE REC] → desired setting

[TYPE3]: TYPE3 AUTO REC signal can be output.  
[OFF]: AUTO REC signal is not output.

## ■ Switching the output method of AUTO REC

Recording control of this unit and external device can be performed with the REC/PAUSE button by setting [SDI REMOTE REC LINK] to [ON].

Select the menu.



[OUTPUT SETUP] → [SDI REMOTE REC LINK] → desired setting

**[ON]:** Performs the recording control of this unit and the external device with the REC/PAUSE button.

**[OFF]:** Recording control of the external device can be performed with the USER button function <REMOTE REC>. (→ 71)

- Setups of the [SDI REMOTE REC] and [SDI REMOTE REC LINK] are set to [OFF] when [SDI MODE SEL] is set to [THROUGH] during the SDI Mode.
- If [TCG] is set to [REC RUN], the time code value may stay the same for a while at the beginning of a clip being recorded with an external device.



# Clip/Still picture playback

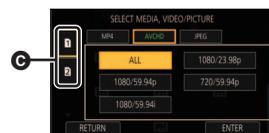
- 1 Set this unit to playback mode. (→ 33)
- 2 Touch the play mode select icon **A**.



## Card display

The selected card slot is displayed in yellow.

- 3 Select the card slot **C** you wish to play back.



- 4 (When setting to clip Playback Mode)

Touch the desired recording mode **D** and recording format **E** for playback.



- To play clips recorded with [PRIORITY MODE] set to [REC/PB(4K)] in Recording Mode, touch Recording Mode [MP4].  
To playback recorded clips set to [REC/PB], touch Recording Mode [AVCHD].
- When there is a recorded clip in Recording Mode, the text color is displayed in green.
- The available recording format options differ depending on [SYSTEM FREQ] (→ 40) or the recording mode option you have touched.
- Next (Previous) page can be displayed by touching **▲** / **▼**.
- Touch [ENTER].
- A recording mode icon **B** will be displayed on the thumbnail display. ( **MP4** / **AVCHD** )

(If you have touched the recording mode option [MP4])

- When you touch recording format, the **4K** icon is displayed in the thumbnail.
- If you touch the recording format option [ALL], all clips of the same recording mode in the selected media are displayed.

For clips with different system frequencies, **▷** **⊗** is displayed in the thumbnail. You can play them back by changing the [SYSTEM FREQ] setting.

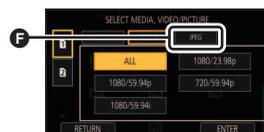
(If you have touched the recording mode option [AVCHD])

- After you have touched a recording format option, one of the following icons will be displayed on each thumbnail.

- **PS** : Clip recorded with: [PS 1080/59.94p]/[PS 1080/50.00p]
- **PH** : Clip recorded with: [PH 1080/59.94i]/[PH 1080/23.98p]/[PH 720/59.94p]/[PH 1080/50.00i]/[PH 720/50.00p]/[PH 1080/59.94i FROM 720p]/[PH 1080/50.00i FROM 720p]
- **HA** : Clip recorded with: [HA 1080/59.94i]/[HA 1080/50.00i]/[HA 1080/59.94i FROM 720p]/[HA 1080/50.00i FROM 720p]
- **HE** : Clip recorded with: [HE 1080/59.94i]/[HE 1080/50.00i]/[HE 1080/59.94i FROM 720p]/[HE 1080/50.00i FROM 720p]
- **PM** : Clip recorded with: [PM 720/59.94p]/[PM 720/50.00p]

(To set this unit to Still Picture Playback Mode)

Touch the still picture (JPEG) **F**.



## 5 Touch the clip or the still picture to be played back.

- Next (Previous) page can be displayed by touching ▲ / ▼.
- You can change the playback media by pressing the USER button to which <SLOT SEL> is registered. (→ 65)



## 6 Select the playback operation by touching the operation icon.



### G Operation icon

- If you touch the screen while an operation icon is being displayed or do not touch the icon for a certain period, it will disappear. To display again, touch the screen.
- The display duration of operation icons can be changed in [OPERATION ICONS DISPLAY]. (→ 225)

Clip playback	Still picture playback
<p>▶/  : Playback/Pause</p> <p>◀◀: Fast rewind playback*<sup>1, 2</sup></p> <p>▶▶: Fast forward playback*<sup>1, 2</sup></p> <p>■: Stops the playback and shows the thumbnails.</p>	<p>▶/  : Slide show (playback of the still pictures in numerical order) start/pause.</p> <p>◀  : Plays back the previous picture.</p> <p>  ▶: Plays back the next picture.</p> <p>■: Stops the playback and shows the thumbnails.</p>

- Playback is also possible by pressing the / / / buttons.

- : Play/stop clip, start/pause slide show
- : Fast rewind\*<sup>1, 2</sup>, play the previous still picture
- : Fast forward\*<sup>1, 2</sup>, play the next still picture
- : Stop and return to thumbnail display

\*1 If you touch twice or push the button twice, the fast rewind/fast forward speed will become faster. (Screen display will change to ◀◀◀ / ▶▶▶ .)

\*2 When pressed during clip playback

## ■ Change the thumbnail display

The thumbnail display will switch in the following order when the AUDIO MON/ADV + button or the AUDIO MON/ADV – button is pressed during thumbnail display.

(AUDIO MON/ADV +)

(AUDIO MON/ADV –)

20 clips ↔ 9 clips ↔ 1 clip ↔ Clip information display\*

\* Detailed clip information is displayed when playing back clips. Following information is displayed.

START TC, START UB, and DURATION are displayed only for AVCHD clips.

- START TC
- START UB
- DATE
- TIME ZONE
- DURATION
- REC MODE
- FORMAT

- If you press the MODE button to switch between Recording Mode and Playback Mode, the thumbnails of 9 clips will be displayed.
- By displaying in 1 clip, recording date and time are displayed when playing back clips, and recording date and file number when playing back still pictures.

## ■ Speaker/Headphone volume adjustment

During clip playback, the speaker/headphone volume can be adjusted with the AUDIO MON/ADV + button and the AUDIO MON/ADV – button.

**Press the AUDIO MON/ADV + button or the AUDIO MON/ADV – button while playing back a clip.**

### **AUDIO MON/ADV + button:**

Increases the volume

### **AUDIO MON/ADV – button:**

Decreases the volume

**A** [VOL]



- If the unit is switched to Playback Mode, the status of the unit displayed on the web screen of the PC/mobile terminal connected to the unit via a network will be switched to standby mode. (→ 143)
- Audio is not output for any playback methods (fast forward, frame-by-frame playback, etc.) other than normal clip playback.
- If you set recording format to [ALL] and play back a clip, the screen may turn dark momentarily when it switches to another clip.
- If you record an MP4 clip for a long period of time, the clip will be automatically split up. When the resulting clips are played back in succession, the changeover between them may not be smooth.

## **Motion picture compatibility**

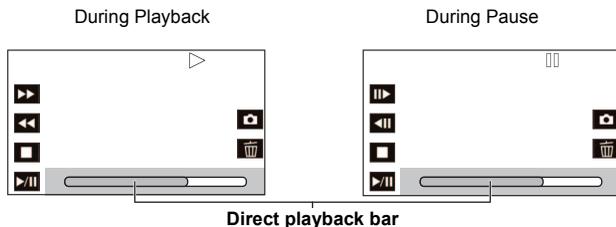
- This unit is based on AVCHD Progressive/AVCHD.
- Even if the devices used have compatible standards, when playback of video recorded using another device is performed using this device, or when video recorded using this device is played back in another device, playback may not proceed normally, or may not be possible. (Please check compatibility in the instruction manual of your device.)
- Motion pictures recorded with devices other than this unit are not supported by this unit.

## **Still picture compatibility**

- This unit is compliant with the unified standard DCF (Design rule for Camera File system) established by JEITA (Japan Electronics and Information Technology Industries Association).
- The file format of still pictures supported by this unit is JPEG. (Not all JPEG formatted files will be played back.)
- This unit may degrade or not play back still pictures recorded or created on other products and other products may degrade or not play back still pictures recorded on this unit.
- Depending on the playback device, still pictures may be played back with picture sizes different from the ones with which they were recorded.

# Motion picture playback using operation icon

For details on the basic playback operations, refer to page 83.



Playback operation	Button operation procedure	Touch operation procedure
<b>Skip playback</b> (to the start of a clip)	Press the ◀◀ / ▶▶ buttons while paused	Touch the LCD monitor and slide from right to left (from left to right) during playback.
<b>Slow-motion Playback</b>	Press and hold the AUDIO MON/ADV + button while paused (the AUDIO MON/ADV – button is reverse slow-motion playback)  It will perform slow-motion playback with continuous frame feed while the button is pressed. <ul style="list-style-type: none"> <li>It will return to normal playback when the ⏮ button is pressed.</li> </ul>	With the playback paused, continue touching ⏮▶. (◀⏮ is for slow rewind playback.)  Slow-motion Playback is performed continuously while the display is touched and held. <ul style="list-style-type: none"> <li>Normal playback is restored when you touch ▶⏮.</li> </ul>
	<ul style="list-style-type: none"> <li>For slow rewind playback, the intervals between frames and the display time per frame vary depending on the type of the clip.</li> </ul>	
<b>Frame-by-frame Playback</b>	Press the AUDIO MON/ADV + button while paused (the AUDIO MON/ADV – button is reverse frame-by-frame playback) <ul style="list-style-type: none"> <li>It will return to normal playback when the ⏮ button is pressed.</li> </ul>	With the playback paused, touch ⏮▶. (Touch ◀⏮ to advance the frames one at a time in the reverse direction.) <ul style="list-style-type: none"> <li>Normal playback is restored when you touch ▶⏮.</li> </ul>
	<ul style="list-style-type: none"> <li>For reverse Frame-by-frame Playback, the intervals between frames vary depending on the type of the clip.</li> </ul>	
<b>Direct playback</b>	—	Touch the direct playback bar or slide it while touching. <ul style="list-style-type: none"> <li>The playback pauses temporarily and skips to the position touched or slid to while touching.</li> <li>(When you touch the bar or slide it while touching during playback) Playback will start by releasing your touching or sliding finger.</li> </ul>

- Clips that are large in file size may cause this unit to respond slower to operations performed by the user or cause certain operations performed by this unit to become slower.

# Useful functions

## Creating still picture from clip

You can save a frame of a recorded motion picture as a still picture. The picture size with which a still picture will be recorded differs depending on the picture size of [REC FORMAT] with which the clip was recorded.

Recording format	Aspect ratio	Picture size
[REC FORMAT] setting with a size of 4K (3840×2160)	16:9	3840×2160
[PS 1080/59.94p]/[PS 1080/50.00p]/ [PH 1080/59.94i]/[PH 1080/23.98p]/[PH 1080/50.00i]/ [PH 1080/59.94i FROM 720p]/[PH 1080/50.00i FROM 720p]/ [HA 1080/59.94i]/[HA 1080/50.00i]/ [HA 1080/59.94i FROM 720p]/[HA 1080/50.00i FROM 720p]/ [HE 1080/59.94i]/[HE 1080/50.00i]/ [HE 1080/59.94i FROM 720p]/[HE 1080/50.00i FROM 720p]		1920×1080
[PH 720/59.94i]/[PM 720/59.94p]/[PH 720/50.00p]/ [PM 720/50.00p]		1280×720

While playing back a motion picture, touch the at the scene you want to save it as a still picture.

- When still pictures are being recorded, the remaining recordable number of still pictures and the still picture indication () are displayed.
- It is convenient to use Pause, Slow-motion Playback and Frame-by-frame Playback.
- Date the clip was recorded will be registered as date of the still picture.



### ■ About the screen indications while recording still pictures



	Card slot selected for still picture recording (→ 229)
	Size of still pictures
<b>R3000</b>	Remaining number of still pictures
	Still picture indication (→ 232)

- Maximum number of recordable pictures that can be displayed is 9999. If the number of recordable pictures exceeds 9999, R 9999+ is displayed. The number will not change when the picture is taken until the number of recordable pictures is 9999 or less.
- The 16:9 still pictures recorded using this unit may be cropped at the edges when printed. So, be sure to check before printing in the store or on your printer.
- Please refer to page 255 about approximate number of recordable pictures.

## Repeat Playback

Playback of the first clip starts after playback of the last clip finishes.

Select the menu.



The indication appears on the full screen views.

- All the clips in the thumbnail list that you display will be played back repeatedly.

- Repeat Playback cannot be used for the slide show playback of the still pictures. (→ 84)

## Resuming the previous playback

If playback of a clip was stopped halfway, the playback can be resumed from where it was stopped.

Select the menu.



If playback of a motion picture is stopped, ⏮ appears on the thumbnail view of the stopped scene.

- The memorized resume position is canceled if one of the following operations is performed ([RESUME PLAY] will not be set to [OFF]):
  - If you turn the unit off
  - If you press the MODE button
  - Changing the recording mode and recording format for playback in Playback Mode

## Playing back scenes or still pictures by date

The clips or still pictures recorded on the same day can be played back in succession.

### 1 Touch the date select icon.



A Date select icon

### 2 Touch the playback date.

- The clips or still pictures recorded on the date selected are displayed as thumbnails.

### 3 Touch the first clip or still picture to be played back.

- Dates cannot be selected while the thumbnail screen for the recording format [ALL] of the recording mode [MP4] is displayed.
- If you press the MODE button to switch between Recording Mode and Playback Mode, the thumbnails of all clips will be displayed.
- In cases such as those described below, clips and still pictures are grouped separately on the date list, and –1, –2... may be added after the date:
  - When the number of clips exceeds 99
  - When the number of still pictures exceeds 999
  - When you change the [REC FORMAT] setting (→ 212)
  - When you set [PRIORITY MODE] to [REC/PB(4K)] and change the system frequency (→ 40)
  - When [CLIP NUMBER RESET] is performed (→ 227)
- Clips recorded with the following [REC FORMAT] settings are grouped separately on the date list. A recording format icon will be displayed next to the date.

Recording format	Icon to be displayed
[REC FORMAT] setting with a size of 4K (3840×2160)	4K
[PS 1080/59.94p]/[PS 1080/50.00p]	PS
[PH 1080/59.94i]/[PH 1080/23.98p]/[PH 720/59.94p]/[PH 1080/50.00i]/ [PH 720/50.00p]/[PH 1080/59.94i FROM 720p]/[PH 1080/50.00i FROM 720p]	PH
[HA 1080/59.94i]/[HA 1080/50.00i]/ [HA 1080/59.94i FROM 720p]/[HA 1080/50.00i FROM 720p]	HA
[HE 1080/59.94i]/[HE 1080/50.00i]/ [HE 1080/59.94i FROM 720p]/[HE 1080/50.00i FROM 720p]	HE
[PM 720/59.94p]/[PM 720/50.00p]	PM

- [↕] is displayed after the date in the list by date for the still pictures created from the clip. (→ 87)



# Deleting scenes/still pictures

Deleted clips/still pictures cannot be restored, so perform appropriate confirmation of the contents before proceeding with deletion.

- Press the MODE button to switch this unit to the Playback Mode. (→ 33)

## ■ To delete the clip or still picture being played back

Touch  while clips or still pictures to be deleted are being played back.



## ■ To delete clips or still pictures from the thumbnail display

- Switch to the thumbnail display of the clips or still pictures to delete. (→ 83)

### 1 Select the menu.

 : [OPERATION] → [DELETE] → desired setting

#### [ALL]:

All the clips or still pictures displayed as thumbnails can be deleted.

(When playing back clips or still pictures by date, all clips or still pictures of the selected date will be deleted.)

#### [MULTI]:

Multiple clips or still pictures can be selected and deleted.

#### [SINGLE]:

Single clip or still picture can be selected and deleted.

- Protected clips/still pictures cannot be deleted.

### 2 (When [MULTI] is selected in Step 1)

**Touch the clip/still picture to be deleted.**

- When touched, the clip/still picture is selected and the  indication appears on the thumbnail. Touch the clip/still picture again to cancel the operation.
- Up to 99 clips can be selected to be deleted.

(When [SINGLE] is selected in Step 1)

**Touch the clip/still picture to be deleted.**

### 3 (When [MULTI] is selected in Step 1)

**Touch [Delete].**

- To continuously delete other clips/still pictures, repeat Steps 2-3.

### **When you stop deleting halfway:**

Touch [CANCEL] or press MENU button while deleting.

- The clips or still pictures that have already been deleted when the deletion is canceled cannot be restored.

### **To complete editing:**

Touch [Return] or press MENU button.

- 
- The following clips/still pictures cannot be deleted:
    - Clips/still pictures that cannot be played back (the thumbnails are displayed as )
  - In case of [ALL], the deletion may take time if there are many clips or still pictures.
  - If you delete clips recorded on other products or still pictures conforming to DCF standard with this unit, all the data related to the clips/still pictures may be deleted.
  - When still pictures recorded on an SD card by other products are deleted, a still picture (other than JPEG) that cannot be played back on this unit, may be erased.

## **Protecting clips/still pictures**

---

Clips/still pictures can be protected so that they are not deleted by mistake.

**(Even if you protect some clips/still pictures, formatting the SD card will delete them.)**

- Press the MODE button to switch this unit to the Playback Mode. (→ 33)

### **1 Select the menu.**



### **2 Touch the clip/still picture to be protected.**

- When touched, the clip/still picture is selected and the  indication appears on the thumbnail. Touch the clip/still picture again to cancel the operation.
- Touch [Return] to complete the settings.



# Copying between SD cards

Clips or still pictures recorded with this unit can be copied between the SD cards inserted in this unit.

- Copying is not possible if the type of the source SD card (SDHC Memory Card/SDXC Memory Card) is different from that of the target SD card.

## ■ Check the used space of the copy destination

It is possible to check the used space of the SD Card by [CARD STATUS]. (→ 221)

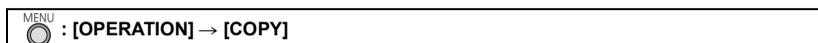
- By displaying in 1 clip, recording date and time can be checked when playing back clips, and recording date and file number when playing back still pictures.
- Depending on the media condition, some remaining capacity of the SD Card may not be used.

## Copying

### 1 Press the MODE button to switch this unit to the Playback Mode.

- Use a sufficiently charged battery or the AC adaptor.

### 2 Select the menu.



[ 1 → 2 ]: Copies from card 1 to card 2

[ 2 → 1 ]: Copies from card 2 to card 1

### 3 Touch desired items following the screen display.

- It will return to the previous step by touching [Return].
- (When [SELECT CLIPS] is selected)
  - When touched, the clip is selected and the indication appears on the thumbnail. Touch the clip again to cancel the operation.
- (When [SELECT DATE] is selected)
  - When touched, the date is selected and surrounded by red. Touch the date again to cancel the operation.
- Up to 99 clips or 99 dates can be set in succession.

### 4 Touch [EXIT] when the copy complete message is displayed.

- The thumbnail view of the copy destination is indicated.

### *When you stop copying halfway*

Touch [CANCEL] while copying.

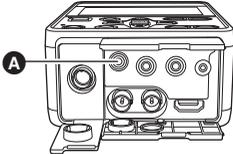
**If you will delete the clips or still pictures after copying is complete, be sure to play back the clips or still pictures to check that they have been copied correctly before deleting.**

- The copying may take long time when there are many clips.
- If some clips or still pictures have already been recorded to the copy destination, then the same date may be assigned or images may not display by date when the list by date is selected.
- Clips that have been recorded on another device may not be copied. Data recorded on a PC cannot be copied.
- The settings for the copied clips and still pictures will be cleared if the protected clips or still pictures are copied.
- The order in which the clips or still pictures were copied cannot be changed.

# Connecting Headphones, a Wired Remote Control or an External Monitor

## Headphones

You can connect headphones (commercially-available) to the headphone output terminal (3.5 mm (0.14 ") diameter stereo mini jack).



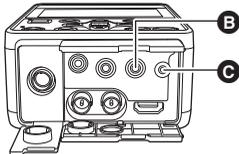
**A** Headphone output terminal

- Sound is not output from the speaker when headphones are connected.

## Wired Remote Control CAM

You can connect a wired remote control (commercially-available) to either of the CAM REMOTE terminals (FOCUS IRIS or ZOOM S/S).

- Connecting a wired remote control to the FOCUS IRIS terminal (3.5 mm (0.14 ") diameter mini jack) allows you to remotely control the focus and iris.
- Connecting a wired remote control to the ZOOM S/S terminal (2.5 mm (0.1 ") diameter super-mini jack) allows you to remotely control the zoom and start/stop recording.



**B** FOCUS IRIS terminal  
**C** ZOOM S/S terminal

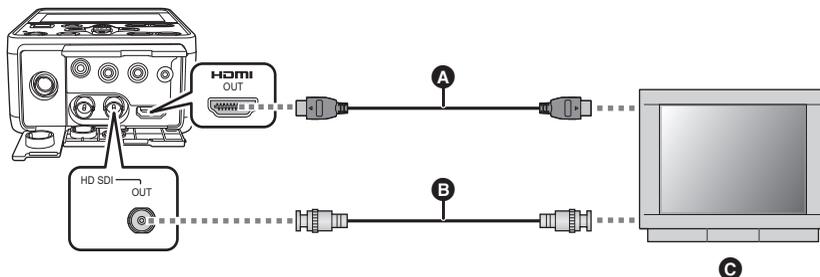
- Do not connect any device other than a wired remote control to the CAM REMOTE terminals. Doing so may change the image brightness or cause the image to be out of focus.

(When a wired remote control is connected to the FOCUS IRIS terminal)

- The wired remote control takes priority for iris (aperture), and adjustment with this unit is not possible.

## External monitor

You can connect this unit to an external monitor as shown in the figure below.



- A** HDMI Cable (commercially-available)
- B** BNC cable (commercially-available)
- C** External monitor

- More detailed 4K video can be enjoyed by connecting this unit to a 4K video compatible external monitor with a HDMI cable, and playing back MP4 clip. For the external monitor not compatible to 4K video, playback with lower output resolution is possible by setting [RESOLUTION].

**When connecting with an HDMI cable using an HDMI-to-DVI converter, etc., be sure to connect the HDMI cable to the connector of this unit last.**

**Connecting the HDMI cable to the connector of this unit first may result in malfunction.**

- The video signal of the SDI output may stop temporarily when the HDMI cable is disconnected and connected or the connected monitor is replaced, for example.
- This unit is not compatible with the VIERA Link.
- Use a commercially-available High Speed HDMI cable. If possible, we recommend using a cable with a length of 3 m (9.84 feet) or less.
- Use a commercially-available, double-shielded BNC cable equivalent to 5C-FB.
- If you connect this unit to the external monitor when this unit is set to Recording Mode, a squealing sound may be output.

### ■ To watch images on an external monitor (4:3) or when both sides of the images do not appear on the screen

Change the menu setting to display the images correctly. (Check the external monitor setting.)

#### 1 Set [OUTPUT SEL] to [HDMI]

MENU : [OUTPUT SETUP] → [OUTPUT SEL] → [HDMI]

#### 2 Set [RESOLUTION] to [DOWN CONV.]

MENU : [OUTPUT SETUP] → [RESOLUTION] → [DOWN CONV.]

#### 3 Perform menu setup for [DOWN CONV.]

MENU : [OUTPUT SETUP] → [DOWN CONV.] → desired setting

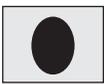
**[SIDE CROP]:** Outputs images so that they are fit to the height of the external monitor screen.

**[LETTERBOX]:** Outputs images so that they are fit to the width of the external monitor screen.

**[SQUEEZE]:** Outputs an image by compressing it in the horizontal direction to fit it in the screen.

- Down-conversion is not possible when outputting to SDI OUT terminal.

Example of images with a [16:9] aspect ratio on an external monitor (4:3):

[DOWN CONV.] setting	
[LETTERBOX]	[SQUEEZE]
	

- When [DOWN CONV.] is set to [SIDE CROP], the sides of an image will be cut off, causing some icons on the external monitor to be hidden from the external monitor screen.

## ■ To display the on-screen information on the external monitor

When the menu setting is changed, the information displayed on the screen (operation icon and Counter display etc.) can be displayed/not displayed on the external monitor.

 : [OUTPUT SETUP] → [CHAR OUTPUT] → [ON] or [OFF]

- This item is set to [OFF] in the following situations when this unit is in Recording Mode:
  - During remote recording (→ 71, 219)

## Switching the output setup of the SDI Mode CAM SDI

Set [SDI MODE SEL] to switch the output method of the SDI OUT terminal.

Select the menu.

 : [OUTPUT SETUP] → [SDI MODE SEL] → desired setting

### (During CAM Mode)

**[THROUGH]:** The Camera Head image can be output with less time lag with this setting than with [NORMAL].  
It is not possible to output menus, characters, and TC/UB information and control recording performed with an external device.

**[NORMAL]:** Menus and characters can be output to the Camera Head image as superimposed text.  
It is possible to output TC/UB information and control recording performed with an external device.

### (During SDI Mode)

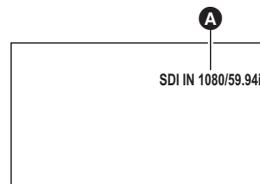
**[THROUGH]:** SDI input signals can be output without time lag or signal degradation.  
It is not possible to output menus and characters.  
The input signal determines whether or not TC/UB information can be output and recording performed with an external device can be controlled.

**[NORMAL]:** SDI input signals can be converted before being output to suit output formats  
It is possible to output and superimpose menus and characters and control recording performed with an external device.  
It is not possible to output TC/UB information.

- Set to [THROUGH] when recording or editing is required in the external device connected to the SDI OUT terminal.
- Even when [THROUGH] is set, depending on the unit's recording or IP streaming settings, data input from the SDI IN terminal may not be output to the SDI OUT terminal.

## About SDI input signal format SDI

SDI input signal format **A** is displayed in the screen of this unit during SDI Mode. It may not be possible to set [REC FORMAT] depending on the signal format.



- For setup of [REC FORMAT], refer to page 212.
- Confirm that this unit and the SDI output device is correctly connected and the setup of the signal format for the SDI output device is correct when one of the following messages is displayed.
  - [INVALID SDI INPUT FORMAT. PLEASE CHANGE RECORD FORMAT.]
  - [INVALID SDI INPUT FORMAT. PLEASE CHANGE IP FORMAT.]
  - [UNDELIVERABLE FORMAT.]
  - [INVALID SDI INPUT.]

### ■ SDI signal format that can be input

SDI output of the SDI output device	Signal format
3G-SDI	1920×1080/59.94p/50.00p
HD-SDI	1920×1080/59.94i/50.00i/29.97PsF/23.98PsF/25.00PsF/1280×720/59.94p/50.00p

### ■ SDI signal format that is compatible to the recording format of this unit

Recording format	Signal format
PS 1080/59.94p	1920×1080/59.94p
PS 1080/50.00p	1920×1080/50.00p
PH 1080/59.94i, HA 1080/59.94i, HE 1080/59.94i	1920×1080/59.94i, 1920×1080/29.97PsF
PH 1080/23.98p	1920×1080/23.98PsF
PH 1080/50.00i, HA 1080/50.00i, HE 1080/50.00i	1920×1080/50.00i, 1920×1080/25.00PsF
PH 1080/59.94i FROM 720p, HA 1080/59.94i FROM 720p, HE 1080/59.94i FROM 720p	1280×720/59.94p
PH 720/59.94p, PM 720/59.94p	
PH 1080/50.00i FROM 720p, HA 1080/50.00i FROM 720p, HE 1080/50.00i FROM 720p	1280×720/50.00p
PH 720/50.00p, PM 720/50.00p	

- Do not input an irregular signal or a signal with continuous disruption.  
This may cause the device to restart or operate erratically.
- Start recording after confirming that an image signal is input.  
Recording cannot be started if there is no image signal.
- Do not stop the signal being output to the external device or disconnect the cable during recording.  
This may cause the clip to split up or prevent the recording from resuming.

# Setting the external output resolution

Change the setting for outputting images to an external monitor or other external device (recorder, etc.).

## 1 Select the [OUTPUT SEL] menu.

 : [OUTPUT SETUP] → [OUTPUT SEL] → desired setting

**[SDI+HDMI]:** Set this when outputting to both the SDI OUT terminal and the HDMI OUT terminal.

**[SDI]:** Set this when outputting to the SDI OUT terminal.

**[HDMI]:** Set this when outputting to the HDMI OUT terminal.

## 2 Select the [RESOLUTION] menu.

 : [OUTPUT SETUP] → [RESOLUTION] → desired setting

(In Recording Mode)

**[1080p]/[1080i]/[720p]/[DOWN CONV.]**

(In Playback Mode)

**[SYSTEM]/[1080p]/[1080i]/[DOWN CONV.]**

- (In case of Playback Mode)

[SYSTEM] automatically sets the output resolution according to the setting in [REC FORMAT].

If the images are not output on the external device when the setting is [SYSTEM], switch to the method [1080p], [1080i], or [DOWN CONV.] which enables the images to be displayed on your external device. (Please read the operating instructions for the external device.)

- [DOWN CONV.] outputs images in standard picture quality.
- The setup of [RESOLUTION] is reflected only to the external output of the HDMI OUT terminal when [SDI MODE SEL] is set to [THROUGH].

- 
- Images may not be displayed on the external device for several seconds in some cases, such as when changing between clips.
  - It may not be possible to change the setup of [RESOLUTION] depending on the combination of the recording format type and [OUTPUT SEL].
  - If the setup value of [RESOLUTION] is an item that cannot be set when [OUTPUT SEL] or [SDI MODE SEL] is changed, [RESOLUTION] will automatically switch to the setup value matching the input signal.

(During CAM Mode)

– When the recording format is set to anything other than 720/59.94p or 720/50.00p:

1080/59.94i or 1080/50.00i

– When the recording format is set to 720/59.94p or 720/50.00p:

720/59.94p or 720/50.00p

(During SDI Mode)

– It will switch to 1080/59.94p or 1080/50.00p, 1080/59.94i or 1080/50.00i, or 720/59.94p or 720/50.00p in accordance with the input signal.

## About external output resolutions

The external output resolution varies depending on the [RESOLUTION] setting and connected terminal.

- Resolution of the external output will change depending on the number of pixels and frame rate of [REC FORMAT] when [RESOLUTION] is set to [SYSTEM] during the Playback Mode.
- For information about the number of pixels/frame rate during IP streaming using the web screen, refer to page 121.

### ■ During CAM Mode

- When [SYSTEM FREQ] is set to [59.94Hz] and [SDI MODE SEL] is set to [THROUGH]

Recording format	[RESOLUTION] setting	Setup of the [OUTPUT SEL]			
		SDI + HDMI (simultaneous output)		SDI	HDMI
		SDI OUT terminal	HDMI OUT terminal	SDI OUT terminal	HDMI OUT terminal
4K 2160/29.97p	1080p	1080/59.94i	1080/29.97p	1080/59.94i	1080/29.97p
	1080i		1080/59.94i		1080/59.94i
	720p		—		—
	DOWN CONV.		480/59.94p		480/59.94p
4K 2160/23.98p	1080p	1080/59.94i	1080/23.98p	1080/59.94i	1080/23.98p
	1080i		1080/59.94i		1080/59.94i
	720p		—		—
	DOWN CONV.		480/59.94p		480/59.94p
PS 1080/59.94p	1080p	1080/59.94i	—	1080/59.94i	—
	1080i		1080/59.94i		1080/59.94i
	720p		—		—
	DOWN CONV.		480/59.94p		480/59.94p
PH, HA, HE 1080/59.94i	1080p	1080/59.94i	—	1080/59.94i	—
	1080i		1080/59.94i		1080/59.94i
	720p		—		—
	DOWN CONV.		480/59.94p		480/59.94p
PH 1080/23.98p	1080p	1080/59.94i	1080/23.98p	1080/59.94i	1080/23.98p
	1080i		1080/59.94i		1080/59.94i
	720p		—		—
	DOWN CONV.		480/59.94p		480/59.94p
PH, PM 720/59.94p	1080p	720/59.94p	—	720/59.94p	—
	1080i		—		—
	720p		720/59.94p		720/59.94p
	DOWN CONV.		480/59.94p		480/59.94p

- When [SYSTEM FREQ] is set to [50.00Hz] and [SDI MODE SEL] is set to [THROUGH]

Recording format	[RESOLUTION] setting	Setup of the [OUTPUT SEL]			
		SDI + HDMI (simultaneous output)		SDI	HDMI
		SDI OUT terminal	HDMI OUT terminal	SDI OUT terminal	HDMI OUT terminal
4K 2160/25.00p	1080p	1080/50.00i	1080/25.00p	1080/50.00i	1080/25.00p
	1080i		1080/50.00i		1080/50.00i
	720p		—		—
	DOWN CONV.		576/50.00p		576/50.00p
PS 1080/50.00p	1080p	1080/50.00i	—	1080/50.00i	—
	1080i		1080/50.00i		1080/50.00i
	720p		—		—
	DOWN CONV.		576/50.00p		576/50.00p
PH, HA, HE 1080/50.00i	1080p	1080/50.00i	—	1080/50.00i	—
	1080i		1080/50.00i		1080/50.00i
	720p		—		—
	DOWN CONV.		576/50.00p		576/50.00p
PH, PM 720/50.00p	1080p	720/50.00p	—	720/50.00p	—
	1080i		—		—
	720p		720/50.00p		720/50.00p
	DOWN CONV.		576/50.00p		576/50.00p

● When [SYSTEM FREQ] is set to [59.94Hz] and [SDI MODE SEL] is set to [NORMAL]

\*1 Setup of the external output will change depending on the [29.97p/23.98p OUTPUT] setup.

Recording format	[RESOLUTION] setting	Setup of the [OUTPUT SEL]			
		SDI + HDMI (simultaneous output)		SDI	HDMI
		SDI OUT terminal	HDMI OUT terminal	SDI OUT terminal	HDMI OUT terminal
4K 2160/29.97p	1080p	—		—	1080/29.97p
	1080i	1080/59.94i		1080/29.97PsF 1080/59.94i <sup>*1</sup>	1080/59.94i
	720p	—		—	
	DOWN CONV.	—		—	480/59.94p
4K 2160/23.98p	1080p	—		—	1080/23.98p
	1080i	1080/59.94i		1080/23.98PsF 1080/59.94i <sup>*1</sup>	1080/59.94i
	720p	—		—	
	DOWN CONV.	—		—	480/59.94p
PS 1080/59.94p	1080p	—		—	
	1080i	1080/59.94i		1080/59.94i	
	720p	—		—	
	DOWN CONV.	—		—	480/59.94p
PH, HA, HE 1080/59.94i	1080p	—		—	
	1080i	1080/59.94i		1080/59.94i	
	720p	—		—	
	DOWN CONV.	—		—	480/59.94p
PH 1080/23.98p	1080p	—		—	1080/23.98p
	1080i	1080/59.94i		1080/23.98PsF 1080/59.94i <sup>*1</sup>	1080/59.94i
	720p	—		—	
	DOWN CONV.	—		—	480/59.94p
PH, PM 720/59.94p	1080p	—		—	
	1080i	—		—	
	720p	720/59.94p		720/59.94p	
	DOWN CONV.	—		—	480/59.94p

● When [SYSTEM FREQ] is set to [50.00Hz] and [SDI MODE SEL] is set to [NORMAL]

\*2 Setup of the external output will change depending on the [25.00p OUTPUT] setup.

Recording format	[RESOLUTION] setting	Setup of the [OUTPUT SEL]			
		SDI + HDMI (simultaneous output)		SDI	HDMI
		SDI OUT terminal	HDMI OUT terminal	SDI OUT terminal	HDMI OUT terminal
4K 2160/25.00p	1080p	—		—	1080/25.00p
	1080i	1080/50.00i		1080/25.00PsF 1080/50.00i*2	1080/50.00i
	720p	—		—	
	DOWN CONV.	—		—	576/50.00p
PS 1080/50.00p	1080p	—		—	
	1080i	1080/50.00i		1080/50.00i	
	720p	—		—	
	DOWN CONV.	—		—	576/50.00p
PH, HA, HE 1080/50.00i	1080p	—		—	
	1080i	1080/50.00i		1080/50.00i	
	720p	—		—	
	DOWN CONV.	—		—	576/50.00p
PH, PM 720/50.00p	1080p	—		—	
	1080i	—		—	
	720p	720/50.00p		720/50.00p	
	DOWN CONV.	—		—	576/50.00p

## ■ During SDI Mode

Signal input to the SDI input is output to the external output of the SDI OUT terminal without any modification when [SDI MODE SEL] is set to [THROUGH].

- For the signal format that the SDI input is possible, refer to page 95.

### • When [SYSTEM FREQ] is set to [59.94Hz] and [SDI MODE SEL] is set to [THROUGH]

Recording format	[RESOLUTION] setting	Setup of the [OUTPUT SEL]			
		SDI + HDMI (simultaneous output)		SDI	HDMI
		SDI OUT terminal	HDMI OUT terminal	SDI OUT terminal	HDMI OUT terminal
PS 1080/59.94p	1080p	Input signal without modification	1080/59.94p	Input signal without modification	1080/59.94p
	1080i		1080/59.94i		1080/59.94i
	720p		—		—
	DOWN CONV.		480/59.94p		480/59.94p
PH, HA, HE 1080/59.94i	1080p	Input signal without modification	—	Input signal without modification	—
	1080i		1080/59.94i		1080/59.94i
	720p		—		—
	DOWN CONV.		480/59.94p		480/59.94p
PH 1080/23.98p	1080p	Input signal without modification	1080/23.98p	Input signal without modification	1080/23.98p
	1080i		1080/59.94i		1080/59.94i
	720p		—		—
	DOWN CONV.		480/59.94p		480/59.94p
PH, PM 720/59.94p PH, HA, HE 1080/ 59.94i FROM 720p	1080p	Input signal without modification	—	Input signal without modification	—
	1080i		720/59.94p		720/59.94p
	720p		—		—
	DOWN CONV.		480/59.94p		480/59.94p

### • When [SYSTEM FREQ] is set to [50.00Hz] and [SDI MODE SEL] is set to [THROUGH]

Recording format	[RESOLUTION] setting	Setup of the [OUTPUT SEL]			
		SDI + HDMI (simultaneous output)		SDI	HDMI
		SDI OUT terminal	HDMI OUT terminal	SDI OUT terminal	HDMI OUT terminal
PS 1080/50.00p	1080p	Input signal without modification	1080/50.00p	Input signal without modification	1080/50.00p
	1080i		1080/50.00i		1080/50.00i
	720p		—		—
	DOWN CONV.		576/50.00p		576/50.00p
PH, HA, HE 1080/50.00i	1080p	Input signal without modification	—	Input signal without modification	—
	1080i		1080/50.00i		1080/50.00i
	720p		—		—
	DOWN CONV.		576/50.00p		576/50.00p
PH, PM 720/50.00p PH, HA, HE 1080/ 50.00i FROM 720p	1080p	Input signal without modification	—	Input signal without modification	—
	1080i		720/50.00p		720/50.00p
	720p		—		—
	DOWN CONV.		576/50.00p		576/50.00p

- When [SYSTEM FREQ] is set to [59.94Hz] and [SDI MODE SEL] is set to [NORMAL]

\*1 Setup of the external output will change depending on the [29.97p/23.98p OUTPUT] setup.

Recording format	[RESOLUTION] setting	Setup of the [OUTPUT SEL]			
		SDI + HDMI (simultaneous output)		SDI	HDMI
		SDI OUT terminal	HDMI OUT terminal	SDI OUT terminal	HDMI OUT terminal
PS 1080/59.94p	1080p	1080/59.94p		1080/59.94p	
	1080i	1080/59.94i		1080/59.94i	
	720p	—		—	
	DOWN CONV.	—	—	—	480/59.94p
PH, HA, HE 1080/59.94i	1080p	—		—	
	1080i	1080/59.94i		1080/59.94i	
	720p	—		—	
	DOWN CONV.	—	—	—	480/59.94p
PH 1080/23.98p	1080p	—		—	1080/23.98p
	1080i	1080/59.94i		1080/23.98PsF 1080/59.94i*1	1080/59.94i
	720p	—		—	
	DOWN CONV.	—	—	—	480/59.94p
PH, PM 720/59.94p PH, HA, HE 1080/59.94i FROM 720p	1080p	—		—	
	1080i	—		—	
	720p	720/59.94p		720/59.94p	
	DOWN CONV.	—	—	—	480/59.94p

- When [SYSTEM FREQ] is set to [50.00Hz] and [SDI MODE SEL] is set to [NORMAL]

Recording format	[RESOLUTION] setting	Setup of the [OUTPUT SEL]			
		SDI + HDMI (simultaneous output)		SDI	HDMI
		SDI OUT terminal	HDMI OUT terminal	SDI OUT terminal	HDMI OUT terminal
PS 1080/50.00p	1080p	1080/50.00p		1080/50.00p	
	1080i	1080/50.00i		1080/50.00i	
	720p	—		—	
	DOWN CONV.	—	—	—	576/50.00p
PH, HA, HE 1080/50.00i	1080p	—		—	
	1080i	1080/50.00i		1080/50.00i	
	720p	—		—	
	DOWN CONV.	—	—	—	576/50.00p
PH, PM 720/50.00p PH, HA, HE 1080/50.00i FROM 720p	1080p	—		—	
	1080i	—		—	
	720p	720/50.00p		720/50.00p	
	DOWN CONV.	—	—	—	576/50.00p

## ■ During Clip Playback Mode

- When [SYSTEM FREQ] is set to [59.94Hz]

\*1 Setup of the external output will change depending on the [29.97p/23.98p OUTPUT] setup.

Recording format	[RESOLUTION] setting	Setup of the [OUTPUT SEL]			
		SDI + HDMI (simultaneous output)		SDI	HDMI
		SDI OUT terminal	HDMI OUT terminal	SDI OUT terminal	HDMI OUT terminal
4K 2160/29.97p	SYSTEM	1080/59.94p		1080/59.94p	2160/29.97p
	1080p			1080/59.94p	
	1080i	1080/59.94i	1080/29.97PsF 1080/59.94i*1	1080/59.94i	
	DOWN CONV.	—	—	480/59.94p	
4K 2160/23.98p	SYSTEM	1080/59.94p		1080/59.94p	2160/23.98p
	1080p			1080/59.94p	
	1080i	1080/59.94i	1080/23.98PsF 1080/59.94i*1	1080/59.94i	
	DOWN CONV.	—	—	480/59.94p	
PS 1080/59.94p	SYSTEM	1080/59.94p		1080/59.94p	
	1080p			1080/59.94i	
	1080i	1080/59.94i	1080/59.94i		
	DOWN CONV.	—	—	480/59.94p	
PH, HA, HE 1080/59.94i	SYSTEM	1080/59.94i		1080/59.94i	
	1080p	1080/59.94p		1080/59.94p	
	1080i	1080/59.94i		1080/59.94i	
	DOWN CONV.	—	—	480/59.94p	
PH 1080/23.98p	SYSTEM	1080/59.94p		1080/59.94p	1080/23.98p
	1080p			1080/59.94p	
	1080i	1080/59.94i	1080/23.98PsF 1080/59.94i*1	1080/59.94i	
	DOWN CONV.	—	—	480/59.94p	
PH, PM 720/59.94p	SYSTEM	720/59.94p		720/59.94p	
	1080p	1080/59.94p		1080/59.94p	
	1080i	1080/59.94i		1080/59.94i	
	DOWN CONV.	—	—	480/59.94p	

● When [SYSTEM FREQ] is set to [50.00Hz]

\*2 Setup of the external output will change depending on the [25.00p OUTPUT] setup.

Recording format	[RESOLUTION] setting	Setup of the [OUTPUT SEL]			
		SDI + HDMI (simultaneous output)		SDI	HDMI
		SDI OUT terminal	HDMI OUT terminal	SDI OUT terminal	HDMI OUT terminal
4K 2160/25.00p	SYSTEM	1080/50.00p		1080/50.00p	
	1080p				
	1080i	1080/50.00i		1080/25.00PsF 1080/50.00i*2	
	DOWN CONV.	—		576/50.00p	
PS 1080/50.00p	SYSTEM	1080/50.00p		1080/50.00p	
	1080p				
	1080i	1080/50.00i		1080/50.00i	
	DOWN CONV.	—		576/50.00p	
PH, HA, HE 1080/50.00i	SYSTEM	1080/50.00i		1080/50.00i	
	1080p				
	1080i	1080/50.00i		1080/50.00i	
	DOWN CONV.	—		576/50.00p	
PH, PM 720/50.00p	SYSTEM	720/50.00p		720/50.00p	
	1080p	1080/50.00p		1080/50.00p	
	1080i	1080/50.00i		1080/50.00i	
	DOWN CONV.	—		576/50.00p	

**Output resolution of thumbnail screens for [ALL] playback**

- The output resolution of these thumbnail screens is determined by the recording format of the last-played clip.
- (When the recording format for playback is set to [ALL] (→ 83))

If [RESOLUTION] is set to [SYSTEM] and the last clip was not played back successfully, the external output resolution will be set to one of the following values.

- When MP4 clips are displayed: 2160/29.97p or 2160/25.00p
- When AVCHD clips are displayed: 1080/59.94p or 1080/50.00p

■ **During Still Picture Playback Mode**

The output resolution varies depending on the system frequency.

Recording format	[RESOLUTION] setting	Setup of the [OUTPUT SEL]			
		SDI + HDMI (simultaneous output)		SDI	HDMI
		SDI OUT terminal	HDMI OUT terminal	SDI OUT terminal	HDMI OUT terminal
[59.94Hz]	SYSTEM	1080/59.94p		1080/59.94p	
	1080p				
	1080i	1080/59.94i		1080/59.94i	
	DOWN CONV.	—		480/59.94p	
[50.00Hz]	SYSTEM	1080/50.00p		1080/50.00p	
	1080p				
	1080i	1080/50.00i		1080/50.00i	
	DOWN CONV.	—		576/50.00p	



## Connecting to a PC (File transfer/nonlinear editing)

When this device and a computer for editing are connected using a USB 2.0 Cable (commercially-available), image data in the SD card can be transferred.

- This unit supports USB 2.0.
- Concerning non-linear editing, refer to the instruction manual of your editing software.

### Operating environment (mass storage)

- Even if the system requirements mentioned in these operating instructions are fulfilled, some PCs cannot be used.
- The USB equipment operates with the driver installed as standard in the OS.

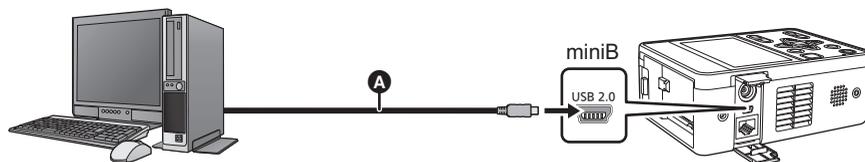
#### ■ If using Windows

<b>OS</b>	Windows 10 (32 bit/64 bit) Pro Windows 7 (32 bit/64 bit) Professional SP1
<b>CPU</b>	1 GHz or higher 32-bit or 64-bit processor
<b>RAM</b>	2 GB or more (64 bit)/1 GB or more (32 bit)
<b>Interface</b>	USB port
<b>Other requirements</b>	Mouse or equivalent pointing device

#### ■ If using Mac

<b>PC</b>	Mac
<b>OS</b>	OS X v10.11, macOS 10.12
<b>CPU</b>	Intel Core 2 Duo or better
<b>RAM</b>	2 GB or more
<b>Interface</b>	USB port
<b>Other requirements</b>	Mouse or equivalent pointing device

## Connecting to a PC



**A** USB 2.0 Cable (A-miniB type) (commercially-available)

- Insert the plugs as far as they will go.

### 1 Connect this unit to the AC adaptor.

- Use the AC adaptor to free you from worrying about the battery running down.

### 2 Turn on the unit.

### 3 Set [PRIORITY MODE] to [REC/PB] or [REC/PB(4K)].

 : [RECORD SETUP] → [PRIORITY MODE] → [REC/PB] or [REC/PB(4K)]

### 4 Press the MODE button to switch to the Playback Mode.

### 5 Connect this unit to a PC.

- The USB function selection screen will appear.

### 6 Touch [PC] on the screen of this unit.

- This unit is automatically recognized as an external drive of the PC. (→ 107)
- When you select an option other than [PC], reconnect the USB Cable.
- When using the battery, the LCD monitor turns off after about 5 seconds. Touch the screen to turn the LCD monitor on.

- 
- This connection cannot be used in the Recording Mode.
  - A USB 2.0 cable is not supplied with this unit.  
Please use a commercially available cable compatible with the USB 2.0 standard. Connect the miniB connector to this unit.
  - When performing reading/writing between a PC and an SD card, be aware that some SD card slots built into PCs and some SD card readers/writers are not compatible with the SDHC Memory Card or SDXC Memory Card.

## ■ To disconnect USB Cable safely

(For Windows)

Select the  icon in task tray displayed on the PC, and then select the model number of this unit to disconnect the USB cable.

- Depending on your PC's settings, this icon may not be displayed.

(For Mac)

Drag [CAM\_SD] disk icon to the [Trash], and then disconnect the USB Cable.

### About the screen indication of the unit

- Do not disconnect the USB Cable, battery, or AC adaptor while the access lamp is on or card access icon (  ) appears on the unit screen.
- If the screen does not change when the unit is operated while connected to a PC, disconnect the battery and/or AC adaptor, wait approximately 1 minute, reconnect the battery and/or AC adaptor, wait approximately 1 minute again, and then turn the unit back on. (Data may be destroyed when above operation is performed while accessing the SD card.)

# About the PC display

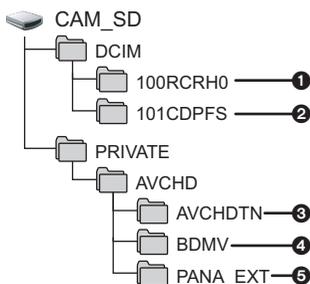
When the unit is connected to a PC, it is recognized as an external drive.

- Removable disk (Example:  CAM\_SD (F:) ) is displayed in [Computer].

Data recorded using AVCHD format has excellent compatibility with computers, due to its file form; however, it contains not just image and sound data, but also various important information, and it is associated using a folder structure which is like a figure. If even part of this information is changed or erased, faults may occur; for example, it may not be possible for the data to be recognized as AVCHD data, or it may no longer be possible for the SD card to be used in an AVCHD device.

Data from a computer cannot be written to the SD card of this device.

## Example folder structure of a SD card:



The following data will be recorded.

- ① MP4 format motion picture data ([01000001.MP4], etc.)
- ② JPEG format still pictures created from the clip (Maximum number of recordable pictures: 999 ([11010001.JPG] etc.))
- ③ The clip thumbnails
- ④ AVCHD format motion picture files ([00000.MTS] etc.)
- ⑤ For management

## Folder names for motion picture data recorded in MP4 format

The folder name changes depending on the frame rate and the [RECORDER ID] setting of the recorded MP4 clip.



- A** Recorder ID (→ 214)
- B** Frame rate

(Example) If the folder name is 100RCRH0:

Video data with number of pixel of 3840×2160 and frame rate of 29.97 fps is included.

<b>Frame rate</b>	<b>C:</b> 29.97 fps <b>D:</b> 25 fps <b>F:</b> 23.98 fps
<b>Recorder ID</b>	<b>0 to 9:</b> Numbers between 0 and 9 is set in [RECORDER ID]. <b>A to G:</b> Numbers between 10 and 16 is set in [RECORDER ID].

- Do not delete the SD card's folders on a PC. Doing so may make the SD card unusable in this unit.
- When data not supported by this unit has been recorded on a PC, it will not be recognized by this unit.
- Always use this unit to format SD cards.

# Use the remote camera controller/ remote operation panel

Up to a hundred units can be operated by IP connection from a Panasonic controller (AW-RP50, AW-RP120 and AK-HRP200). (The maximum length of the LAN cables is 100 meters (328 ft).)

## ■ Controller supported

- AW-RP50 : Ver 4.00.00 or later
- AW-RP120 : Ver 3.00.00 or later
- AK-HRP200 : Ver 6.00-00-0.00 or later

### ● If the version older, an upgrade is required.

For details on upgrading, visit the support page on the following website.

<https://pro-av.panasonic.net/>

## ■ What AW-RP50/AW-RP120 can do

The following functions can be used.

- Selection of the camera head to be operated
  - Menu setup
  - Zoom operation
  - Manual recording
    - Focus
    - Iris (aperture) adjustment
    - Gain adjustment
    - Shutter speed
  - White balance (excluding ATW Lock)
  - Black level (master pedestal) adjustment
  - Switching between Day mode/Night mode
  - Setup of color temperature ([COLOR TEMP])
  - Setup of the optical image stabilization function
  - Setup of the digital extender ([D.EXTENDER]) function
  - Assignment of [COLOR TEMP] and [DIGITAL EXTENDER] to the [USER] button
- 
- Panning/tilting cannot be performed with the controller.  
In addition, preset memories and camera setup files cannot be saved.
  - If you switch the system frequency by operating the unit, even when the unit reboots, the controller (or similar peripheral device) may not reboot along with the unit. If this happens, turn off and on the controller.
  - For the function that can be used with AK-HRP200, refer to page 116.
  - For details, refer to the operating Instructions of the controller.

# Menu operation method

Camera Text Menu operation	Remote camera controller		
	AW-RP50	AW-RP120	AK-HRP200
Selecting the unit to be operated	Press one of the [CAMERA STATUS/SELECTION] buttons.		<b>1 Press and hold the [SELECT] button for about 2 seconds.</b> <ul style="list-style-type: none"> <li>The camera number in the camera number display area blinks.</li> </ul> <b>2 Press the lit [UP]/[DOWN] button.</b> <ul style="list-style-type: none"> <li>Press the lit [UP]/[DOWN] button to select the camera number.</li> </ul> <b>3 Press the [SELECT] button.</b> <ul style="list-style-type: none"> <li>Control of the selected camera is enabled.</li> </ul>
Displaying the Top Menu	Press the [CAMERA OSD] button for about 2 seconds.		Press and hold the [CHARA/MENU] button for about 2 seconds.
	<ul style="list-style-type: none"> <li>The Camera Text Menu of this unit is displayed in the IP image. *</li> <li>* The Camera Text Menu is not output from the HDMI OUT terminal/SDI OUT terminal of this unit.</li> </ul>		
Selecting the items	Turn the [F1] dial.		Turn the [SELECT] dial.
Displaying the sub-menus	Press the [F1] dial.		Press the [SELECT] dial.
Returning to the previous menu	With the cursor at the "Return" position, press the [F1] dial.		With the cursor at the "Return" position, press the [SELECT] dial.
Changing the settings	<b>1 Press the [F1] dial to start the setting blinking.</b> <b>2 Turn the [F1] dial to change the setting.</b> <b>3 Press the [F1] dial to enter the setting (and stop the blinking).</b>		<b>1 Press the [SELECT] dial to start the setting blinking.</b> <b>2 Turn the [SELECT] dial to change the setting.</b> <b>3 Press the [SELECT] dial to enter the setting (and stop the blinking).</b>
Exiting the menu operations	Press the [CAMERA OSD] button for about 2 seconds.		Press and hold the [CHARA/MENU] button for about 2 seconds.

- The Camera Text Menu is not displayed when [PRIORITY MODE] is set to [IP(4K)] or [REC/PB(4K)].
- Perform the menu operations and exit from the menus using the controller which displayed the Top Menu. If a menu operation has been performed or a menu has been exited using another controller, first display the Top Menu and exit from it using one controller, and then display the Top Menu and exit from it using the other controller.
- The unit uses a different method to operate its menus from the one employed by the convertible cameras and HD integrated cameras which have already been launched onto the market. For details, refer to the Operating Instructions of the camera concerned.
- The response speed of the camera differs slightly depending on the controller used.

## ■ To set menu items on the IP image

The Camera Text Menu is displayed on the IP image as superimposed text by setting [DISPLAY MENU] (→ 227) to [TEXT] and then performing the operation to display the Top Menu on the unit.

- The Camera Text Menu is not displayed on the LCD monitor of the unit or the device connected via the SDI or HDMI output.

## ■ To set menu items on the LCD monitor of the unit or the screen of the output destination

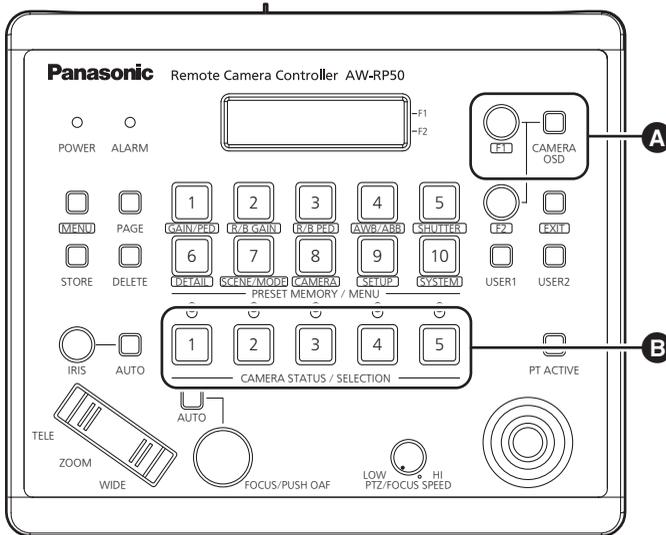
The menu of the unit can be displayed on the LCD monitor of the unit and the SDI or HDMI output destination and operated with the controller by setting [DISPLAY MENU] to [TOUCH] and then performing the operation to display the Top Menu on the unit.

- The menu is not displayed on the IP image.

# Operation method

For menu operation (Camera Text Menu), refer to page 109.

## Remote camera controller [AW-RP50]



- A** For operating the Camera Text Menus.

### [CAMERA OSD]:

When this is pressed for about 2 seconds, the selected camera menu is displayed, overlapping the camera output image. When it is pressed for about 2 seconds while a menu is displayed, the menu is exited.

### [F1]:

Turn [F1] to move the cursor up and down in the Camera Text Menu or to change setting values. Press [F1] to move to the next level of a menu item or to change a setting value at the lowest level.

- B** For selecting the cameras to be operated.

## ■ Switching between Day and Night mode

### 1 Press the [MENU] button on the AW-RP50.

- The [MENU] button lights, and the [PRESET MEMORY/MENU] buttons become selectable.

### 2 Press the [9 (SETUP)] button in the [PRESET MEMORY/MENU] area.

- The button lights, and the [SETUP] menu appears on the LCD panel.

### 3 Turn the [F1] dial to select “FUNCTION”, then press the [F1] dial.

- Press the [EXIT] button if [FUNCTION] is not displayed.

### 4 Turn the [F1] dial to select “OPTION”.

- “Off” or “On” appears on the bottom right (F2 area) of the LCD panel.

### 5 Turn the [F2] dial to select “Off” or “On”, then press the [F2] dial.

[Off]: Infrared Recording Mode Off

[On]: Infrared Recording Mode On

- If you operate the [IRIS] dial in Manual Iris Mode, the iris is adjusted, while if you operate the dial in Auto Iris Mode, the setup value of [AE LEVEL] is adjusted.
- When one of [IRIS MODE]/[GAIN MODE]/[SHUTTER MODE] is set to [AUTO], even if you adjust the iris/gain/shutter speed, the brightness may not change.

## ■ Color temperature setting ([COLOR TEMP])

### 1 Press the [MENU] button on the AW-RP50.

- The [MENU] button lights, and the [PRESET MEMORY/MENU] buttons become selectable.

### 2 Press the [4 (AWB/ABB)] button in the [PRESET MEMORY/MENU] area.

- The button lights, and the AWB/ABB menu appears on the LCD panel.

### 3 Turn the [F1] dial to select “VAR”.

- Color temperature configuration is enabled when “VAR” is selected, and it is initially set to the color temperature held on the camera.

To adjust the setting, proceed to the following.

### 4 Press the [8 (CAMERA)] button in the [PRESET MEMORY/MENU] area.

- The button lights, and the GROUP menu appears on the LCD panel.

### 5 Turn the [F1] dial to select “COLOR TEMP”, then press the [F1] dial.

- The color temperature appears on the bottom right (F2 area) of the LCD panel.
- Press the [EXIT] button if [COLOR TEMP] is not displayed.

### 6 Turn the [F2] dial to select the color temperature.

## ■ Optical image stabilization function setting

### 1 Press the [MENU] button on the AW-RP50.

- The [MENU] button lights, and the [PRESET MEMORY/MENU] buttons become selectable.

### 2 Press the [9 (SETUP)] button in the [PRESET MEMORY/MENU] area.

- The button lights, and the [SETUP] menu appears on the LCD panel.

### 3 Turn the [F1] dial to select “FUNCTION”, then press the [F1] dial.

- Press the [EXIT] button if [FUNCTION] is not displayed.

### 4 Turn the [F1] dial to select “I.S.”, then press the [F1] dial.

- “Off” or “On” appears on the bottom right (F2 area) of the LCD panel.

### 5 Turn the [F2] dial to select “Off” or “On”, then press the [F2] dial.

[Off]: Image stabilization function not used.

[On]: Image stabilization function used.

## ■ Digital extender ([D.EXTENDER]) function setting

### 1 Press the [MENU] button on the AW-RP50.

- The [MENU] button lights, and the [PRESET MEMORY/MENU] buttons become selectable.

### 2 Press the [9 (SETUP)] button in the [PRESET MEMORY/MENU] area.

- The button lights, and the [SETUP] menu appears on the LCD panel.

### 3 Turn the [F1] dial to select “FUNCTION”, then press the [F1] dial.

- Press the [EXIT] button if [FUNCTION] is not displayed.

### 4 Turn the [F1] dial to select “D. EXTENDER”.

- “Off” or “On” appears on the bottom right (F2 area) of the LCD panel.

### 5 Turn the [F2] dial to select “Off” or “On”, then press the [F2] dial.

[Off]: D.Zoom function Off

[On]: D.Zoom function On

## ■ Assigning [COLOR TEMP] and [DIGITAL EXTENDER] to the [USER] buttons

It is possible to assign off/on for the color temperature setting ([COLOR TEMP]) or for the digital extender function ([DIGITAL EXTENDER]) to the [USER] button.

### 1 Press the [MENU] button on the AW-RP50.

- The [MENU] button lights, and the [PRESET MEMORY/MENU] buttons become selectable.

### 2 Press the [9 (SETUP)] button in the [PRESET MEMORY/MENU] area.

- The button lights, and the [SETUP] menu appears on the LCD panel.

### 3 Turn the [F1] dial to select "USER", then press the [F1] dial.

- Press the [EXIT] button if [USER] is not displayed.

### 4 Turn the [F1] dial to select "USER1" or "USER2", then press the [F1] dial.

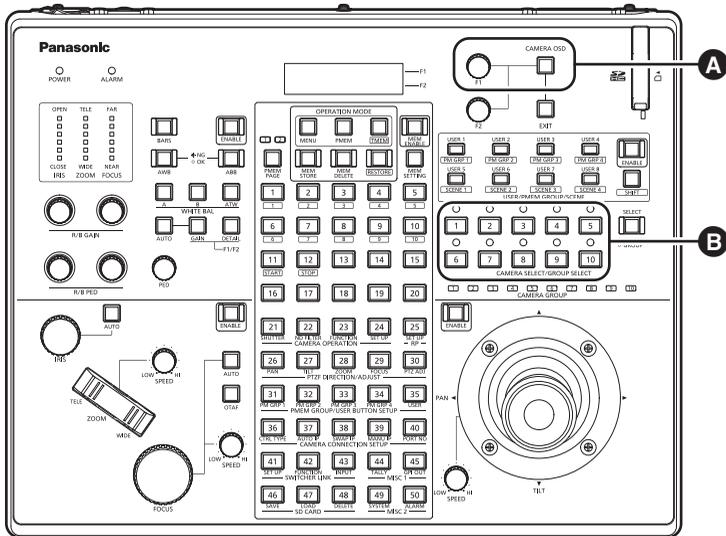
- The functions that can be assigned to the [USER] button appear on the bottom right (F2 area) of the LCD panel.

### 5 Turn the [F2] dial to select "COLOR TEMP" or "D.EXT" then press the [F2] dial.

[COLOR TEMP]: Color temperature settings

[D. EXT]: D.Zoom function

## Remote camera controller [AW-RP120]



- A** For operating the Camera Text Menus.

### [CAMERA OSD]:

When this is pressed for about 2 seconds, the selected camera menu is displayed, overlapping the camera output image. When it is pressed for about 2 seconds while a menu is displayed, the menu is exited.

### [F1]:

Turn [F1] to move the cursor up and down in the Camera Text Menu or to change setting values. Press [F1] to move to the next level of a menu item or to change a setting value at the lowest level.

- B** For selecting the cameras to be operated.

## ■ Switching between Day and Night mode

### 1 Press the [MENU] button on the AW-RP120.

- The [MENU] button lights.

### 2 Press the [FUNCTION] menu [23] button.

- The button lights, and the [OPTION] menu appears on the LCD panel.

### 3 Turn the [F1] dial to select "FUNCTION", then press the [F1] dial.

### 4 Turn the [F1] dial to select "OPTION".

- "Off" or "On" appears on the bottom right (F2 area) of the LCD panel.

### 5 Turn the [F2] dial to select "Off" or "On", then press the [F2] dial.

[Off]: Infrared Recording Mode Off

[On]: Infrared Recording Mode On

- If you operate the [IRIS] dial in Manual Iris Mode, the iris is adjusted, while if you operate the dial in Auto Iris Mode, the setup value of [AE LEVEL] is adjusted.
- When one of [IRIS MODE]/[GAIN MODE]/[SHUTTER MODE] is set to [AUTO], even if you adjust the iris/gain/shutter speed, the brightness may not change.

## ■ Color temperature setting ([COLOR TEMP])

### 1 Press the [EXIT] button and the [ATW] button of [WHITE BAL] simultaneously.

- The [A], [B], and [ATW] buttons of [WHITE BAL] light, and color temperature setting mode is enabled.  
The color temperature setting value appears on the LCD screen during this time.

### 2 Turn the [F1] dial to change the color temperature.

- Press the [A], [B], and [ATW] buttons of [WHITE BAL] to return to the mode of the selected button.  
The mode will switch from the color temperature mode to the original mode after a specific amount of time passes.  
To configure the color temperature setting again, press the [EXIT] button and the [ATW] button of [WHITE BAL] simultaneously.

## ■ Optical image stabilization function setting

### 1 Press the [MENU] button on the AW-RP120.

- The [MENU] button lights.

### 2 Press the [FUNCTION] menu [23] button.

- The button lights, and the [OPTION] menu appears on the LCD panel.

### 3 Turn the [F1] dial to select “I.S.”, then press the [F1] dial.

- “Off” or “On” appears on the bottom right (F2 area) of the LCD panel.

### 4 Turn the [F2] dial to select “Off” or “On”, then press the [F2] dial.

[Off]: Image stabilization function not used.

[On]: Image stabilization function used.

## ■ Digital extender ([D.EXTENDER]) function setting

### 1 Press the [MENU] button on the AW-RP120.

- The [MENU] button lights.

### 2 Press the [FUNCTION] menu [23] button.

- The button lights, and the [OPTION] menu appears on the LCD panel.

### 3 Turn the [F1] dial to select “D. EXTENDER”.

- “Off” or “On” appears on the bottom right (F2 area) of the LCD panel.

### 4 Turn the [F2] dial to select “Off” or “On”, then press the [F2] dial.

[Off]: D.Zoom function Off

[On]: D.Zoom function On

## ■ Assigning [COLOR TEMP] and [DIGITAL EXTENDER] to the [USER] buttons

It is possible to assign off/on for the color temperature setting ([COLOR TEMP]) or for the digital extender function ([DIGITAL EXTENDER]) to the [USER] button.

### 1 Press the [MENU] button on the AW-RP120.

- The [MENU] button lights.

### 2 Press the [USER] menu [35] button.

- The button lights, and the [USER1] menu appears on the LCD panel.

### 3 Turn the [F1] dial to select a button from “USER1” to “USER8”.

- The functions that can be assigned to the [USER] button appear on the bottom right (F2 area) of the LCD panel.

### 4 Turn the [F2] dial to select “COLOR TEMP” or “D.EXT” then press the [F2] dial.

[COLOR TEMP]: Color temperature settings

[D. EXT]: D.Zoom function



	Control/display component	Label	AG-UMR20 ○ : Supported △ : Supported with some restrictions — : Not supported	Remarks
6	Auto setup switch	[AUTO SETUP]	—	
7	5600K switch	[5600K]	○	[WHITE BALANCE MODE] is set to [P5600K] when this switch is set to ON, and set to [ATW] when the switch is set to OFF.
8	Matrix switch	[MATRIX]	—	
9	Skin color detail switch	[SKIN DTL ON]	△	[SKIN TONE DTL] is set to [HIGH] when this switch is set to ON, and set to [OFF] when the switch is set to OFF.
10	Knee OFF switch	[KNEE OFF]	—	
11	Detail OFF switch	[DTL OFF]	—	
12	Shutter ON/OFF switch, STEP/SYNC switch	[SHUTTER ON STEP/SYNC]	△	<ul style="list-style-type: none"> <li>• The SHUTTER display stays turned off in Auto Shutter Mode.</li> <li>• Press this switch while the SHUTTER display is turned off to switch to STEP.</li> <li>• Press and hold this switch to switch between STEP and SYNC.</li> <li>• It is not possible to switch from STEP/ SYNC to Auto Shutter Mode.</li> </ul>
13	Scene / user file selection switch	[SCENE/ USER FILE SHIFT]	—	
14	Scene / user file 1 switch	[SCENE/ USER FILE1]	○	Equivalent to [F1:].
15	Scene / user file 2 switch	[SCENE/ USER FILE2]	○	Equivalent to [F2:].
16	Scene / user file 3 switch	[SCENE/ USER FILE3]	○	Equivalent to [F3:].
17	Scene file 4 switch	[SCENE FILE4]	○	Equivalent to [AUTO]
18	Scene / user file storage switch	[SCENE/USER FILE STORE]	—	
19	Volume lock switch	[VOL LOCK]	○	
20	R gain volume	[GAIN R]	○	
21	B gain volume	[GAIN B]	○	
22	R flare / pedestal volume	[FLARE/PED]	—	
23	B flare / pedestal volume	[FLARE/PED]	—	
24	DTL volume	[DTL]	○	[DETAIL LEVEL] can be adjusted.

	Control/display component	Label	AG-UMR20 ○ : Supported △ : Supported with some restrictions — : Not supported	Remarks
25	Data set (up)	[DATA SET UP]	○	ND/ZOOM/FOCUS can also be adjusted.
26	Data set (down)	[DATA SET DOWN]	○	
27	Adjustment value display	[ND], [CC], [M.GAIN], [SHT], [SYNC], [M.PED]	○	
28	IRIS display	[IRIS]	—	Adjustments can be made, but the IRIS value cannot be displayed.
29	ND/CC display selection switch	[DISPLAY SELECT]	△	Used for ND / ZOOM / FOCUS MODE switching.
		[ND/CC]		
30	ND display	[ND]	○	Displays "1:Clear", "2:1/4", "3:1/16", and "4:1/64".
31	CC display	[CC]	—	
32	M.GAIN / M.PED display	[DISPLAY SELECT]	○	
	Selection switch	[M.GAIN/M.PED]		
33	M.GAIN display	[M.GAIN]	○	
34	M.PED display	[M.PED]	○	
35	SHUTTER display selection	[DISPLAY SELECT]	○	
	Selection switch	[SHUTTER]		
36	SHUTTER display	[SHT]	△	The shutter value (1/100) is fixed during transition from SYNC.
37	SYNC display	[SYNC]	△	"----" appears in the adjustment value display during SYNC.
38	Camera number display	[CAM No.]	○	
39	Camera number tens display	[10-19]	○	
40	Camera selection switch	[CAM SEL]	○	
41	Menu / character switch	[CHARA MENU ON/OFF]	○	
42	Rotary selection switch	[SELECT]	○	<ul style="list-style-type: none"> <li>When MENU OFF is set, if [ZOOM] is selected with the ND/CC display selection switch, [FOCUS] can be adjusted.</li> <li>When MENU OFF is set, if [FOCUS] is selected with the ND/CC display selection switch, [ZOOM] can be adjusted.</li> </ul>
43	Red/green tally display, call switch	[TALLY/CALL]	—	CALL is disabled.
44	Alarm display	[ALARM]	—	

	Control/display component	Label	AG-UMR20 ○ : Supported △ : Supported with some restrictions – : Not supported	Remarks
45	Optical alarm display	[OPT]	–	
46	Iris / master pedestal lock	[IRIS/M.PED LOCK]	○	
47	Iris lever	[IRIS (↑ ↓)]	○	The IRIS value is not displayed in the adjustment value display.
48	Master pedestal volume	[M.PED (← →)]	○	
49	Preview switch	[PUSH PREVIEW]	–	
50	Fader full switch	[FADER FULL]	–	
51	Auto iris switch	[AUTO]	○	
52	Iris close switch	[CLOSE]	–	
53	Sense volume	[SENSE]	△	Used for ZOOM/FOCUS SPEED adjustment.
54	Coarse volume	[COARSE]	–	
55	Lens extender display	[EXT]	–	
56	Digital extender display	[D.EXT]	○	The indicator lights when the [D.ZOOM] is set to [ON].
57	SD card access display	[SD CARD]	○	

# Remote operation by a PC

It is possible to distribute the streaming image of the unit (IP image transmission) or change the setup of the unit (IP control) with the web browser screen of a PC by connecting the unit and a PC with a wired LAN network.

## Functions that can and cannot be controlled simultaneously

The number of pixels of the streaming image or the format that can be recorded in the SD card differs depending on the [Priority Mode] (→ 144) setup.

○: Recording is possible/—: Recording or distribution is not possible

[Priority Mode] setting	Record to SD card	H.264	JPEG
		IP streaming	
REC/PB(4K)	○	—	Distribution of 1ch is possible
REC/PB	○	Distribution of 1ch is possible	
IP(4K)	—	Distribution of 2ch is possible	
IP	—	Distribution of 2ch is possible	

- The image right before the REC check is displayed as the IP image during REC check.
- The time stamp of IP image in H.264 can be displayed in case of CAM Mode.
- The time stamp of IP image in JPEG can be displayed in case of CAM Mode when [Priority Mode] is set to [REC/PB] or [IP].

(When [Priority Mode] is set to [IP])

- When the SDI input signal format is 1920×1080/23.98PsF, images in H.264/JPEG format cannot be displayed on the Live screen of the unit.

(When [Priority Mode] is set to [REC/PB])

- When [REC FORMAT] is set to [PH 1080/23.98p], images in H.264 format cannot be displayed on the Live screen of the unit.

(When [Priority Mode] is set to [IP(4K)])

- This unit cannot display H.264 format 4K images on the Live screen. To display 4K images, use an external device or external software that supports 4K images.

## About number of pixels/frame rate during SD card recording and IP streaming

- Refer to page 144 for information about [Priority Mode], and page 146 for information about [Recording format].

### ■ During CAM Mode

- When [SYSTEM FREQ] is set to [59.94Hz]

[Priority Mode] setting	[Recording format] setting	Record to SD card	H.264	JPEG
			IP streaming	
REC/PB(4K)	4K 2160/29.97p 50M	3840×2160/29.97p	—	640×360/ 30fps, 15fps, 5fps
	4K 2160/23.98p 50M	3840×2160/23.98p	—	
REC/PB	PS 1080/59.94p	1920×1080/59.94p	1920×1080/ 30fps, 15fps, 5fps 1280×720/ 30fps, 15fps, 5fps	
	PH, HA 1080/59.94i	1920×1080/59.94i	1920×1080/59.94i 30fps, 15fps, 5fps 640×360/ 30fps, 15fps, 5fps	
	HE 1080/59.94i	1440×1080/59.94i	1280×720/ 30fps, 15fps, 5fps	
	PH, PM 720/59.94p	1280×720/59.94p	640×360/ 30fps, 15fps, 5fps	
	PH 1080/23.98p	1920×1080/23.98p	—	

[Priority Mode] setting	Setup of H.264(1)	H.264(1)	H.264(2)	JPEG
		IP streaming		
IP(4K)	3840×2160/29.97p	3840×2160/ 30fps, 15fps, 5fps	—	640×360/ 30fps, 15fps, 5fps
IP	1920×1080	1920×1080/60fps, 30fps, 15fps, 5fps	1280×720/ 30fps, 15fps, 5fps	
		1280×720	1280×720/60fps, 30fps, 15fps, 5fps	640×360/ 30fps, 15fps, 5fps

- When [SYSTEM FREQ] is set to [50.00Hz]

[Priority Mode] setting	[Recording format] setting	H.264		JPEG
		Record to SD card	IP streaming	
REC/PB(4K)	4K 2160/25.00p 50M	3840×2160/25.00p	—	640×360/ 25fps, 12.5fps, 5fps
REC/PB	PS 1080/50.00p	1920×1080/50.00p	1920×1080/ 25fps, 12.5fps, 5fps 1280×720/ 25fps, 12.5fps, 5fps	
	PH, HA 1080/50.00i	1920×1080/50.00i	1920×1080/50.00i 25fps, 12.5fps, 5fps 640×360/ 25fps, 12.5fps, 5fps	
	HE 1080/50.00i	1440×1080/50.00i	1280×720/ 25fps, 12.5fps, 5fps	
	PH, PM 720/50.00p	1280×720/50.00p	640×360/ 25fps, 12.5fps, 5fps	

[Priority Mode] setting	Setup of H.264(1)	H.264(1)	H.264(2)	JPEG
		IP streaming		
IP(4K)	3840×2160/25.00p	3840×2160/ 25fps, 12.5fps, 5fps	—	640×360/ 25fps, 12.5fps, 5fps
IP	1920×1080	1920×1080/50fps, 25fps, 12.5fps, 5fps	1280×720/ 25fps, 12.5fps, 5fps	
		1280×720	1280×720/50fps, 25fps, 12.5fps, 5fps	640×360/ 25fps, 12.5fps, 5fps

## ■ During SDI Mode

- When [SYSTEM FREQ] is set to [59.94Hz]

[Priority Mode] setting	SDI output device format	Record to SD card	H.264	JPEG
			IP streaming	
REC/PB	1920×1080/59.94p	1920×1080/59.94p	1920×1080/ 30fps, 15fps, 5fps 1280×720/ 30fps, 15fps, 5fps 640×360/ 30fps, 15fps, 5fps	640×360/ 30fps, 15fps, 5fps
	1920×1080/59.94i	1920×1080/59.94i 1440×1080/59.94i		
	1920×1080/29.97PsF		1280×720/ 30fps, 15fps, 5fps 640×360/ 30fps, 15fps, 5fps	
	1280×720/59.94p	1920×1080/59.94i 1440×1080/59.94i 1280×720/59.94p	1280×720/ 30fps, 15fps, 5fps 640×360/ 30fps, 15fps, 5fps	
	1920×1080/23.98PsF	1920×1080/23.98p	—	

[Priority Mode] setting	SDI output device format	H.264(1)	H.264(2)	JPEG
		IP streaming		
IP	1920×1080/59.94p	1920×1080/60fps	1280×720/ 30fps, 15fps, 5fps 640×360/ 30fps, 15fps, 5fps	640×360/ 30fps, 15fps, 5fps
	1920×1080/59.94i, 29.97PsF	1920×1080 30fps, 15fps, 5fps		
	1920×1080/23.98PsF	—	—	

[Priority Mode] setting	Setup of H.264(1)	H.264(1)	H.264(2)	JPEG
		IP streaming		
IP	1280×720/59.94p	1280×720/60fps, 30fps, 15fps, 5fps	1280×720/ 30fps, 15fps, 5fps 640×360/ 30fps, 15fps, 5fps	640×360/ 30fps, 15fps, 5fps

● When [SYSTEM FREQ] is set to [50.00Hz]

[Priority Mode] setting	SDI output device format	Record to SD card	H.264	JPEG
			IP streaming	
REC/PB	1920×1080/50.00p	1920×1080/50.00p	1920×1080/ 25fps, 12.5fps, 5fps	640×360/ 25fps, 12.5fps, 5fps
	1920×1080/50.00i	1920×1080/50.00i 1440×1080/50.00i	1280×720/ 25fps, 12.5fps, 5fps	
	1920×1080/25.00PsF		640×360/ 25fps, 12.5fps, 5fps	
	1280×720/50.00p	1920×1080/50.00i 1440×1080/50.00i 1280×720/50.00p	1280×720/ 25fps, 12.5fps, 5fps 640×360/ 25fps, 12.5fps, 5fps	

[Priority Mode] setting	SDI output device format	H.264(1)	H.264(2)	JPEG
		IP streaming		
IP	1920×1080/50.00p	1920×1080/50fps	1280×720/ 25fps, 12.5fps, 5fps	640×360/ 25fps, 12.5fps, 5fps
	1920×1080/50.00i, 25.00PsF	1920×1080/ 25fps, 12.5fps, 5fps	640×360/ 25fps, 12.5fps, 5fps	

[Priority Mode] setting	Setup of H.264(1)	H.264(1)	H.264(2)	JPEG
		IP streaming		
IP	1280×720/50.00p	1280×720/50fps, 25fps, 12.5fps, 5fps	1280×720/ 25fps, 12.5fps, 5fps 640×360/ 25fps, 12.5fps, 5fps	640×360/ 25fps, 12.5fps, 5fps

## Operating environment (when network connection function is used)

<b>CPU</b>	<p><b>When using 1080/59.94p [59.94Hz] and 1080/50.00p [50.00Hz]</b> Intel Core i7 3.4 GHz or higher recommended <b>Other than above</b> Intel Core 2 Duo 2.4 GHz or higher recommended</p>
<b>Memory</b>	<p><b>For Windows:</b> 32bit OS: 1 GB or more 64bit OS: 2 GB or more <b>For Mac:</b> 2 GB or more</p>
<b>Network function</b>	10BASE-T or 100BASE-TX port × 1
<b>Image display function</b>	<p>Resolution: 1024×768 pixels or more Color generation: True Color 24-bit or more</p>
<b>Supported operating system and Web browser</b>	<p><b>Windows:</b> Windows 7 (32bit/64bit) Professional SP1*1 Windows 10 (32bit/64bit) Pro Internet Explorer 11*2</p>
	<p><b>Mac:</b> OS X v10.11 macOS 10.12 Safari 10</p>
	<p><b>iPhone / iPad / iPad touch</b> iOS 10, Standard browser</p>
	<p><b>Android</b> Android OS 4.4/6.0, Standard browser</p>

\*1 Windows XP Compatible Mode cannot be used.

\*2 Microsoft Edge cannot be used.

### IMPORTANT

- Failure to provide the required personal computer environment may slow down the delineation of the images on the screen, make it impossible for the web browser to work and cause other kinds of problems.

- Use the desktop version of Internet Explorer. (Internet Explorer for Windows UI is not supported.)
- For the most recent information on compatible operating systems and web browsers, visit the support desk at the following web site.  
<https://pro-av.panasonic.net/>
- The operation procedures and screen shots in this document is explained with Windows 10 and Internet Explorer 11.

# Performing network setup with the “Easy IP Setup Software” (For Windows)

Network setup of this unit can be performed with the “Easy IP Setup Software”.

Check the following website, and download and install the “Easy IP Setup Software”.  
<https://pro-av.panasonic.net/>

## ■ Use the Easy IP Setup Software to establish the unit’s settings

The settings related to the unit’s network can be established using the Easy IP Setup Software.

When using multiple units of this product, set up each Camera Head or unit.

If it is not possible to set up using the Easy IP Setup Software, perform the setup of this unit and a PC individually using the [NETWORK SETUP] menu of this unit or the network page in the Setup menu of the web screen.

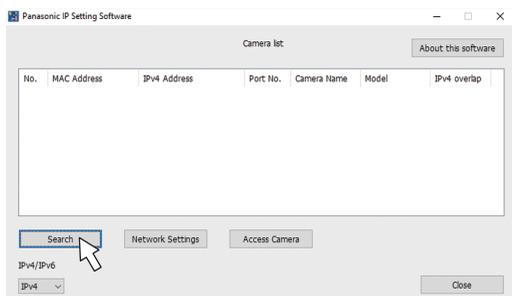
For details, refer to page 128 or 166.

- If, after the network settings have been established, another device in the same network has the same IP address, the network operations will not be performed properly.  
Set the IP address in such a way that it does not duplicate an existing IP address.
- Do not use more than one copy of the Easy IP Setup Software to simultaneously perform the network setup for one Camera Head or Recorder.  
Similarly, do not perform the “Auto IP setting” operation of the remote camera controller (AW-RP50 or AW-RP120) at the same time.  
The IP address settings may no longer be recognized as a result.
- When you start the Easy IP Setup Software, you may be asked for the administrator account password.
- To enhance security, the Easy IP Setup Software is designed so that when around 20 minutes have passed after the Recorder was turned on, the network setup of the target Camera Head or the Recorder can no longer be configured.  
→ When “20min” is selected for the enable time among the “Easy IP Setup accommodate period”. (→ 168)
- The Easy IP Setup Software cannot be used from a different subnet via a router.

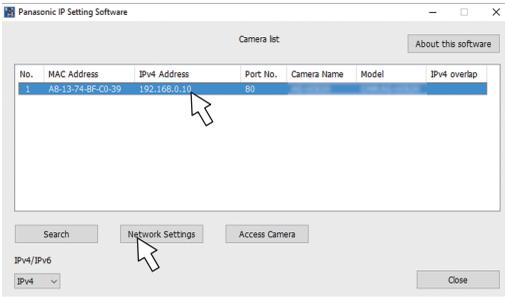
## ■ Setup method

**1** Start the Easy IP Setup Software.

**2** Click the [Search] button.

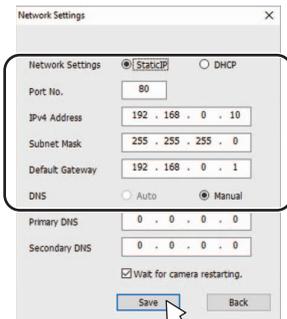


**3** Click the MAC address/IPv4 address of the camera and recorder to be set, and click the [Network Settings] button.



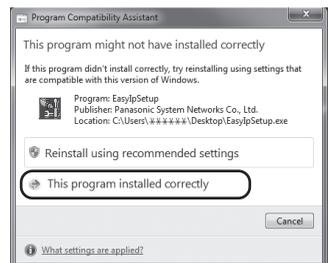
- When a DHCP server is being used, the IP address allocated to the unit can be checked by clicking the [Search] button of the Easy IP Setup Software.
- If IP addresses have been duplicated, the duplicated Camera No. is displayed in the “IPv4 overlap” column of the relevant Camera Head or Recorder.
- When the [Access Camera] button is clicked, the Live screen of the selected camera and recorder is displayed.

**4** Input the network items, and click the [Save] button.



- When a DHCP server is being used, “DNS” of the Easy IP Setup Software can be set to “Auto”.
- After the [Save] button is clicked, it takes about 1 minute for the settings in the unit to be completed. If the AC adaptor or LAN cable is disconnected before the settings are completed, the settings will be canceled. In this case, repeat the steps to establish the settings.
- When a firewall (including software) has been introduced, enable access to all the UDP ports.

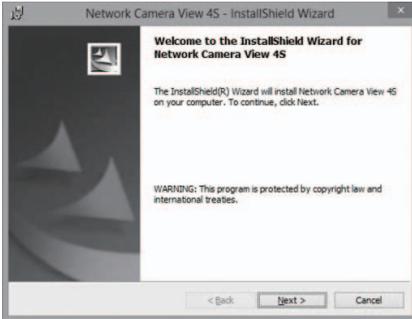
- When the Easy IP Setup Software is used for the first time, the [Program Compatibility Assistant] screen may appear after quitting the Easy IP Setup Software. Select [This program installed correctly] in the [Program Compatibility Assistant] screen.



## ■ Installing the plug-in viewer software

To view IP images from the unit on a web browser, the "Network Camera View 4S" plug-in viewer software (ActiveX®) must be installed in your personal computer.

- When you display the Live screen [Live] on the personal computer for the first time, the installation screen for the plug-in viewer software (ActiveX) appears. Follow the instructions on the screen to perform installation.
- Depending on the operating environment of your computer, you may need to start Internet Explorer with an administrator account during installation.  
(Startup with an administrator account will not be required after installation is complete.)



- [Automatic installation of viewer software] is set to [On] at the time of purchase, allowing you to install directly from the unit. If a message appears in the web browser's information bar, see page 251.
- If the plug-in viewer software (ActiveX) installation screen continues to appear when switching screens, even after it is installed, restart the personal computer.
- To uninstall the plug-in viewer software, select [Control Panel] - [Programs] - [Uninstall a program] in Windows, and remove "Network Camera View 4S".
- If installation of the plug-in viewer software fails, close Internet Explorer with  while the above screen is displayed and then click [Next].

# Set the network on this unit

## 1 Select the menu.

**MENU** : [NETWORK SETUP] → [RECORDER LAN SETUP] or [CAMERA LAN SETUP]

- [RECORDER LAN SETUP] performs the network setup of this unit, and [CAMERA LAN SETUP] performs the network setup of the camera head.
- [RECORDER LAN SETUP] can be set only during SDI Mode.
- [CAMERA LAN SETUP] can be set only during CAM Mode.

## 2 Touch and set the desired items as needed.

- All default settings are indicated with underlined text.

<b>[DHCP]:</b>	Sets if the DHCP function is to be used or not by [ON]/[OFF]. Set the DHCP server so a PC not using the DHCP function and other camera head or this unit does not have the same IP address. Contact the system administrator about the setup of the server. <b>Setup value: [ON]/[OFF]</b>
<b>[IP Address]:</b>	Enter the IP address. <ul style="list-style-type: none"><li>• This is set up as follows at the time of purchase.<ul style="list-style-type: none"><li>– [RECORDER LAN SETUP]: [192.168.0.10].</li><li>– [CAMERA LAN SETUP]: [192.168.0.10].</li></ul></li></ul>
<b>[Subnet Mask]:</b>	Enter the subnet mask. <ul style="list-style-type: none"><li>• The default setting is [255.255.255.0].</li></ul>
<b>[Gateway]:</b>	Enter the gateway. <ul style="list-style-type: none"><li>• The default setting is [192.168.0.1].</li></ul>
<b>[DNS]:</b>	Sets if the DNS server address is to be acquired automatically (Auto) or entered manually (Manual). It is necessary to set the DNS when [MANUAL] is set. The DNS server address is automatically acquired by setting to [AUTO] when the DHCP function is used. Contact the system administrator about the setup. <b>Setup value: [AUTO]/[MANUAL]</b>
<b>[Primary DNS]/ [Secondary DNS]:</b>	Enter the IP address of the DNS server when [MANUAL] is to be used for [DNS]. Contact the system administrator about the IP address of the DNS server.
<b>[MAC Address]:</b>	Displays the MAC address.

- [IP Address], [Subnet Mask], and [Gateway] cannot be set when [DHCP] is set to [ON].
- [MAC Address] cannot be changed.

## Entering text

Operate in the same way as you enter characters with a keyboard.



Icon	Description of operation
[A-a]	Switches between uppercase and lowercase.
[Return]	Returns to the previous screen. The entered characters are canceled.
[ 123 #+=]	Switches to symbols and numbers.
[_]	Enters a space.
[BS]	Deletes a character. Deletes the previous character if the cursor is in an empty space.
 / 	Moves the cursor to left or right.
[Enter]	Ends text entry.

### 3 Touch [EXIT].

- 
- A connection cannot be made unless the combination of the IP address, subnet mask, and gateway are correct.
  - When not using the gateway, set it to [0.0.0.0].

# User authentication

The unit can be configured to allow **access from the internet**. To prevent infringement of privacy and personality rights, information leaks, and other issues concerning **unauthorized access by third parties**, we recommend enabling the user authentication function upon installation. We also recommend using DIGEST authentication when connecting to a device that supports DIGEST authentication.

- The **AW-RP50, AW-RP120, and AK-HRP200** support DIGEST authentication.

## Getting started:

- Display the web screen of the Camera Head or the unit by operating the PC connected to the unit (→ 131).
- Click [Setup] → [User mng.] to display the user management screen (→ 133, 164).

The screenshot shows the 'User auth.' configuration screen. It has a dark blue header with the title 'User auth.'. Below the header, there are two rows of radio button options. The first row is for 'User auth.' with 'Off' and 'On' options; an arrow labeled '1' points to the 'On' option. The second row is for 'Authentication' with 'Basic' and 'Digest' options; an arrow labeled '2' points to the 'Digest' option. Below these options is a 'Set' button. The next section contains three input fields: 'User name', 'Password', and 'Retype password', each with a text box; an arrow labeled '3' points to the 'Password' field. Below these fields is an 'Access level' section with two radio button options: '1. Administrator' and '2. Camera control'. Below this is another 'Set' button. The final section is 'User check', which has a dropdown menu showing 'admin[1]' and a 'Delete' button; an arrow labeled '4' points to the 'Delete' button.

- 1 Select [On] for [User auth.]**
  - After selecting, click the [Set] button.
- 2 (When using a device that supports DIGEST authentication) Select [Digest] for [Authentication].**
  - After selecting, click the [Set] button.
- 3 Enter information in the [User name], [Password], and [Retype password] fields to create a new user name/password.**
  - Select [1. Administrator] for the [Access level].
  - After entering, click the [Set] button.
- 4 Delete the default user name from [User check].**
  - Click the [Delete] button after selecting the user name to be deleted ([admin[1]]).

## User name and password management

- **Use a combination of characters and numbers that is difficult to guess.**  
Avoid using a string of the same characters, such as “11111”, birth dates, or telephone numbers. For information about the types and number of characters that can be entered, refer to [User name [1 to 32 half-size characters]] in [User management screen [User mng.]]. (→ 164)
- **Change user names and passwords periodically.**
- **Make sure to manage the configured user names and passwords.**
- **Delete all user names that do not have an assigned user.**
- **To prevent third parties from identifying user names and passwords, register new user name information (user names and passwords) and delete the default user name information.**
- **We recommend creating a password of at least 8 characters, including at least 3 types of characters from digits (single-byte), uppercase alphabetic characters (single-byte), lowercase alphabetic characters (single-byte), and special characters.**

## After changing the user name/password

Also change the user names and passwords registered to the following.

Refer to the operating instructions provided with your product for further information about the settings used for your product.

- Remote Camera Controller (AW-RP50, AW-RP120)
- Remote Operation Panel (AK-HRP200)
- Browsers and applications on computers, tablets, and smartphones.

## Displaying the web screen

**The time zone screen and the clock setting screen are automatically displayed at the time of purchase. It is necessary to set the time zone and clock on the unit before operating it from the web screen. (→ 36)**

With a PC connected to the unit, it is possible to view the IP image of the Camera Head or the unit or select various settings from the web browser.

Select an IP address for the personal computer within the private address range while ensuring that it is different from the address of the unit. Set the subnet mask to the same address as the unit.

### Unit's IP address and subnet mask (factory settings)

**IP address:**

192.168.0.10

**Subnet mask:**

255.255.255.0

**Range of private addresses:**

192.168.0.0 to 192.168.0.255

- If the controller and web browser are being used at the same time, the content selected using the controller may not be reflected on the web browser display. When using both the controller and web browser, be absolutely sure to check the settings using the controller or camera menu.

**For the operating environment of a PC, refer to page 124.**

- Some functions of the web setup screen are available only if you are using a Windows PC. (Not available for Mac)
- For Windows, it is necessary to install the viewer plug-in software "Network Camera View 4S" in advance to display the IP image of the unit. (Not required for Mac)  
For further details, refer to "Installing the plug-in viewer software" (→ 127).

## Displaying the web screen using a personal computer

The procedure is explained here using Windows screens (Internet Explorer), but it is the same when using the Mac (Safari)\* screens.

\* There may be differences in some parts of the screen displays.

### 1 Start the web browser of the personal computer.

Operating system installed	Web browser
Windows	Internet Explorer
Mac	Safari

### 2 Enter the IP address you configured on the Easy IP Setup Software or the unit in the address bar of the web browser.

**IPv4 address entry example:**

http://URL registered with IPv4 address

http://192.168.0.10/



- If the HTTP port number has been changed from "80", enter "http://<IP address of the Camera Head or the unit>:<port number>" in the address bar.

Example: When the port number is set to 8080:

http://192.168.0.11:8080

### 3 Press the [Enter] key.

- The web screen appears.

The live screen [Live] (→ 134) is displayed initially. You can switch to the web setup screen [Setup] (→ 143) when necessary. (→ 133)



- If the personal computer does not have the plug-in viewer software already installed, an installation confirmation message is displayed before the live screen [Live] is displayed. In a case like this, follow the on-screen instructions to install the software. [Windows](#)  
For further details, refer to “Installing the plug-in viewer software” (→ 127).
- When an attempt is made to display multiple H.264 images on one personal computer, IP videos may not be displayed depending on the performance of the personal computer concerned. [Windows](#)
- Up to 14 users (consisting of users receiving H.264 images and users receiving JPEG images) can access the unit at the same time. However, the number of users that can access the unit may be less than 14 depending on the settings. When [Transmission type] is set to [Multicast] for [H.264], the second and subsequent users receiving H.264 images will not be counted toward the total access count. When the access limit has been reached, the screen shown on the right is displayed.



- The image refresh speed may become slower depending on the network environment, performance of your computer, subject, number of accesses, and settings configured.
- When the shooting scenes vary significantly, restrictions imposed by the graphics processing (GDI) of the operating system installed may give rise to a phenomenon called “screen tearing” (where parts of the picture are not displayed in synchronization) although this will depend on the personal computer used.
- If you are using a Windows PC, H.264 images and JPEG images can be displayed by setting [H.264 transmission] (→ 149) to [On]. When it is set to [Off], only JPEG images will appear.
- When [H.264 transmission] and [JPEG transmission] are all set to [Off], a black JPEG screen is displayed.
- If you are using a Mac computer, regardless of the [H.264 transmission] settings, only JPEG images will appear. (H.264 images will not appear.)

## Switching between the Live screen [Live] and Web setup screen [Setup]

### ■ To switch from the Live screen to the Web setup screen

When the live screen [Live] is displayed, click the [Setup] **A** button.

- For details on the web setup screen [Setup], see “Logging into the Web setup screen [Setup]” (→ 142).



### ■ To switch from the Web setup screen to the Live screen

When the web setup screen [Setup] is displayed, click the [Live] **B** button.

- For details on the live screen [Live], see “Live screen [Live]” (→ 134, 141).



- During Standby mode, the [Setup] button is disabled, and you cannot switch to the web setup screen [Setup].
- If the unit is switched to Standby mode from another terminal while the web setup screen [Setup] is displayed, the display will automatically switch to the live screen [Live] after a few seconds.

# Operating from the web screen

The Live screen [Live] includes a “single display mode” that displays the IP image of a single Camera Head or a single unit of this product and a “multi display mode” that displays the IP images of multiple Camera Heads or multiple units of this product.

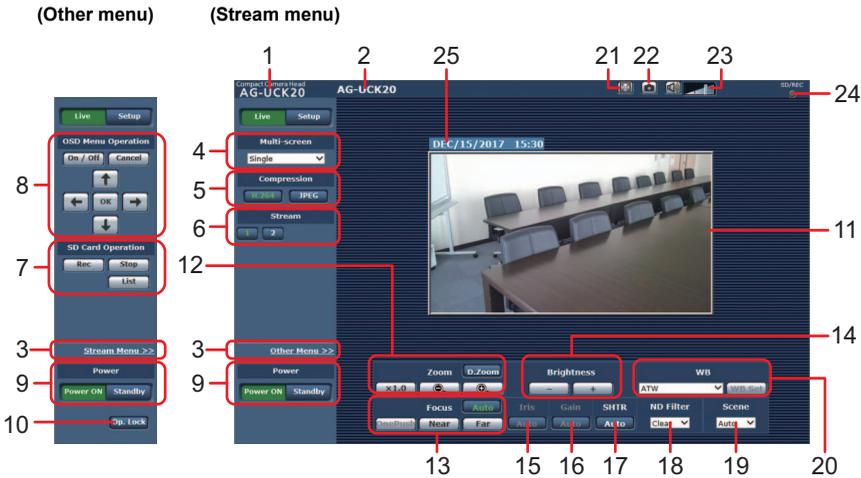
See below for details on the single display mode, and see page 141 for details on the multi display mode.

## Live screen [Live]: Single display mode

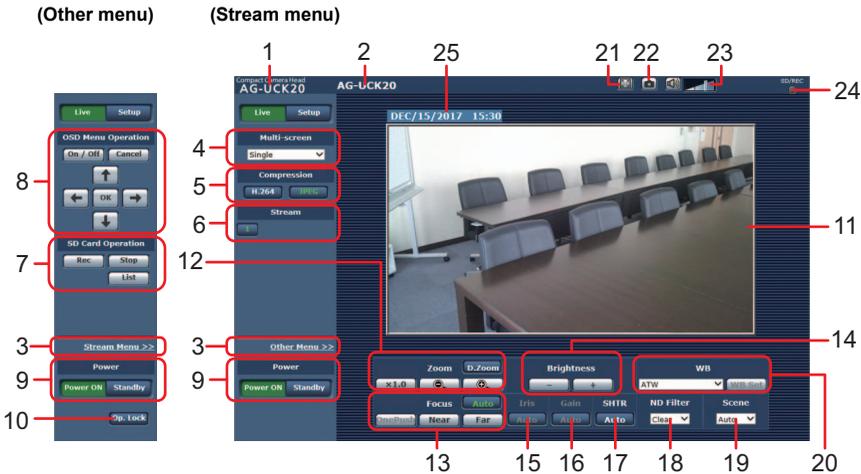
Operate the PC to display the IP image of the Camera Head or the unit or control the zoom and focus of the Camera Head.

The items displayed on the screen will differ depending on whether the [H.264] or [JPEG] button is selected under [Compression].

When [H.264] is selected Windows



When [JPEG] is selected



## 1 Connected device information

[Compact Camera Head AG-UCK20] is displayed when the web screen is displayed in CAM Mode, while [Memory Card Portable Recorder AG-UMR20] is displayed when the screen is displayed in SDI Mode.

## 2 Camera title information

The name set in [Camera title] on the Basic screen [Basic] (→ 145) is displayed.

## 3 Menu switching [Other Menu >>]/[Stream Menu >>]

Switch between menu displays.

Clicking [Other Menu >>] when the Stream menu is displayed displays the Other menu.

Clicking [Stream Menu >>] when the Other menu is displayed displays the Stream menu.

- The Stream menu is always displayed when the web screen is updated and the Live screen is displayed from another screen. However, this is not the case when recording to an SD card.

## 4 Multi-screen list box [Multi-screen]

- The live screen [Live] display method is selected here.

Single ▼	Displays the IP image of the Camera Head or the unit.
4Split 1/4 Group ▼	Multiple IP images can be viewed on a single screen by selecting the devices for multi-screen display (Camera Heads/Recorders) beforehand in the multi screen setup screen [Multi-screen] (→ 163). (Multi display mode)
4Split 2/4 Group ▼	
4Split 3/4 Group ▼	
4Split 4/4 Group ▼	
16Split ▼	

## 5 Compression buttons [Compression]

	When selected, the text on the button turns green, and H.264 images are displayed. <b>Windows</b> The [H.264] button is enabled when the [H.264 transmission] setting of [H.264(1)] to [H.264(2)] on the Video over IP is [On]. (→ 149)
	When selected, the text on the button turns green, and JPEG images are displayed.

- The [H.264] button is not displayed when [PRIORITY MODE] is set to [IP(4K)] or [REC/PB(4K)].
- In the following cases, the selection status of the [Compression] buttons will return to the setting configured in the [Video over IP] tab - [Initial display settings for "Live" page] - [Stream]. **Windows**
  - When returning from another screen
  - When the screen is updated

## 6 Stream buttons [Stream]

### When [H.264] is selected Windows

These buttons appear only when H.264 images are displayed.

	When selected, the text on the button turns green, and the images in the main area appear according to the settings configured for [H.264(1)]. (→ 149)
	When selected, the text on the button turns green, and the images in the main area appear according to the settings configured for [H.264(2)]. (→ 149)

- In the following cases, the selection status of the [Stream] buttons will return to the setting configured in the [Video over IP] tab - [Initial display settings for "Live" page] - [Stream]. Windows
  - When returning from another screen
  - When the screen is updated
- The selected H.264 image may be reduced to a size smaller than actual size depending on the size of the Web browser window

### When [JPEG] is selected

	When selected, the text on the button turns green, and the images in the main area appear according to the settings configured for [JPEG(1)]. (→ 148)
---	---

## 7 SD Card Operation buttons [SD Card Operation]

Perform the operations for recording the video and audio captured with the unit to an SD card.

	Starts recording to an SD card. The SD access lamp on the top right of the screen is displayed in red during recording.
	Stops recording to an SD card.
	Displays a list of the recorded content.

## 8 Camera Text Menu Operation [OSD Menu Operation]

	Switches the display/hide of the Camera Text Menu.
	It cancels the selection of the setting which is being changed. It restores the pre-change setting.
	Use these to perform the menu operations. The items are selected using the [←/→/↑/↓] buttons. If a selected item has a sub menu, this sub menu is displayed by pressing the [OK] button. When the cursor is moved to any item on the bottom-level setting screen and the [OK] button is pressed, the setting of the selected item starts flashing. While the setting of the selected item is flashing, if another item is selected, the setting of the newly-selected item will be reflected immediately. Press the [OK] button to stop the flashing and enter the new setting.

- The Camera Text Menu is not displayed on the IP image if [DISPLAY MENU] is set to [TOUCH] on the unit. (→ 227)
- The Camera Text Menu is displayed on the IP image as superimposed text by setting [DISPLAY MENU] to [TEXT] on the unit and then setting the Camera Text Menu display to [On] on the web screen.  
The Camera Text Menu is not displayed on the LCD monitor of the unit or the output destination of the HDMI OUT/SDI OUT terminal.
- For Camera Text Menu, refer to page 140.

## 9 Power ON button [Power ON]/Standby button [Standby]

	Turn the unit on.
	Set the unit to Standby mode.

In the Standby mode, all the buttons on the live screen [Live] except for the [Multi-screen] list box and the [Power ON] button are disabled.

- If [Power ON] or [Standby] is selected too quickly, the status selected and the display shown may not correspond. In a case like this, follow the steps below to restore the correct status display:

### For Windows:

Press the [F5] key on the keyboard of the personal computer.

### For Mac:

Press the [Command] + [R] keys on the keyboard of the personal computer.

## 10 Operation lock button [Op. Lock]

	Locks the operation of the zoom, focus, brightness, Iris Mode, Gain Mode, Shutter Mode, White Balance, ND Filter, and Select Scene in the control screen. Use this also to lock the Other menu operations and [Power ON] button/[Standby] button to prevent operations from being performed by accident.
---	---

## 11 Main area (IP video display area)

The IP image of the unit is displayed.

Operating the mouse wheel inside the display area allows you to use the plug-in viewer software's digital zoom. [Windows](#)



## 12 Zoom [Zoom]

	Use this to enable or disable the digital zoom
	Use this to adjust the zoom (magnification) to 1.0x.
	Use this to adjust the zoom (magnification) in the Wide direction.
	Use this to adjust the zoom (magnification) in the Tele direction.

## 13 Focus [Focus]

	Use this to switch between auto and manual focusing. When Auto (  ) is selected, the focus is adjusted automatically.
	When this is pressed while the focus is being adjusted manually, the focus will be temporarily adjusted automatically. It is disabled when Auto is selected.
	Use this to adjust the focus in the near ([Near]) direction.
	Use this to adjust the focus in the far ([Far]) direction.

## 14 Brightness [Brightness]

	Use this to make the image darker.
	Use this to make the image lighter.

- The iris is adjusted by operating [-]/[+] when [Iris]/[Gain]/[SHTR] are all set to [Manual] (). It can also be adjusted by pressing and holding [-]/[+].
- The [AE Level] setup is adjusted by operating [-]/[+] when one of [Iris]/[Gain]/[SHTR] setups is set to [Auto] (). It cannot be adjusted by pressing and holding [-]/[+].
- When [Infrared REC] is set to [On] and [Iris]/[Gain]/[SHTR] are all set to [Manual] () , [Brightness] cannot be adjusted.

## 15 Iris Mode [Iris]

	Switches the Auto/Manual of the iris. Iris is adjusted automatically when set to Auto (  ).
---	--

## 16 Gain Mode [Gain]

	Switches the Auto/Manual of the gain. Gain is adjusted automatically when set to Auto (  ).
---	--

## 17 Shutter Mode [SHTR]

	Switches the Auto/Manual of the shutter speed. Shutter speed is adjusted automatically when set to Auto (  ).
---	--

## 18 ND filter [ND Filter]

	Changes the ND filter setting using the pull-down menu.
---	---

## 19 Scene Selection [Scene]

	Changes the Recording Mode using the pull-down menu.
---	--

## 20 White Balance Mode [WB]

	Changes the White Balance mode using the pull-down menu.
	Performs Auto White Balance if the [WB Set] button is pressed when the White Balance mode is set to [AWB A] or [AWB B].

## 21 Full-screen display button

	Display the image in full-screen mode. When the image displayed in the main area is compressed, clicking this once displays the image at the correct resolution in the main area. When the image is displayed at the correct resolution, the image is displayed in full-screen mode. To return to the Live screen, press the [Esc] key on the personal computer while the image is displayed in full-screen mode. The aspect ratio of the displayed image will be adjusted according to the monitor size.
---	---

## 22 Snapshot button Windows

	<p>Capture a snapshot (single still image), and display it in a separate window. A menu appears when you right-click the image, and you can select [Save] to save the image to the personal computer.</p> <p>You can also click [Print] to output from a printer.</p>
---	---

- The following settings may be necessary.  
In the Internet Explorer menu bar, click [Tools] - [Internet Options] - [Security] tab, select [Trusted Sites], and then click [Sites]. When the [Websites] list is displayed, add the address of the Camera Head or the unit to the list.
- Depending on the network environment, for example, if snapshot capture takes longer than a certain amount of time, the image may not appear.

## 23 Audio button Windows

	<p>Switches the On/Off of the audio and adjusts the volume on a PC. (→ 153)</p> <ul style="list-style-type: none"><li>• By clicking on , the button display will switch to , and audio in the PC is muted. (Audio on this unit will not turn off)</li><li>• Move the cursor (  ) to adjust the volume to the one of three levels: low, medium, and high.</li></ul>
---	---

-  is displayed for the audio input whose volume cannot be adjusted. Switching On/Off of audio is possible.
- [Input Volume] setup in [Audio] is also changed when the volume is adjusted.
- When [Audio Level] is set to [Auto], the volume can be adjusted, but the actual input volume does not change. The adjusted volume will be applied after the [Audio Level] setting is changed to [Manual].

## 24 SD access lamp [SD/REC]

When an SD card is being accessed, this lamp is displayed in red.

## 25 Date and time indication

Displays the date and time set on the unit. ("Clock settings tab [Date&Time]" on page 144)

- Deviation of time display may result when the date and time are displayed for a long time. In such cases, update the Web screen or display some other screen for a moment before redisplaying the Live screen.

## About the Camera Text Menu CAM

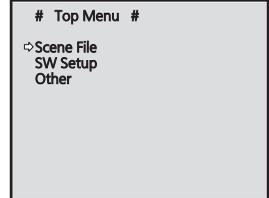
Since the setup of this unit is performed with the remote camera controller via network, the Camera Text Menu can be displayed in the IP image as superimposed text.

- The Camera Text Menu can be displayed only during CAM Mode.
- For remote camera controller, refer to page 108.

### ■ About displaying the Camera Text Menu

The “#” marks in the menu titles indicate the hierarchical level of the menu currently displayed.

For instance, “# TOP MENU #” indicates the first hierarchical level whereas “## SCENE FILE ##” indicates that the second hierarchical level is now displayed.



### ■ To set menu items on the IP image

The Camera Text Menu is displayed on the IP image as superimposed text by setting [DISPLAY MENU] (→ 227) to [TEXT] on the unit and then setting the menu display to [On] on the web screen.

- The Camera Text Menu is not displayed on the LCD monitor of the unit or the device connected via the SDI or HDMI output.

### ■ To set menu items on the LCD monitor of the unit or the screen of the output destination

The menu of unit can be displayed on the LCD monitor of the unit and the device connected via the SDI or HDMI output and operated with the controller by setting [DISPLAY MENU] to [TOUCH] on the unit and then setting the menu display to [On] on the web screen.

- The menu is not displayed on the IP image.

- The Camera Text Menu cannot be displayed during SDI Mode.
- The Camera Text Menu cannot be displayed when [PRIORITY MODE] is set to [REC/PB(4K)] or [IP(4K)].
- The Camera Text Menu is erased when the MENU button on this unit is pressed while displaying the Camera Text Menu.
- The Top Menu does not have a “RETURN” setting.

To close the menu screen, use the controller to perform the operation to close the menu screen. (→ 109)

### ■ Menu items that can be set with the Camera Text Menu

The following menus can also be set with the Camera Text Menu.

Camera Text Menu	Settings	Operation procedure
“SHUTTER SPEED”	Sets the shutter speed.	“SW SETUP”→“SHUTTER SPEED”
“GAIN”	Adjusts the gain value.	“SW SETUP”→“GAIN”
“VOLUME”	Adjusts the input level of audio.	“OTHER FUNCTION”→“VOLUME”
“OSD STATUS”	Displays the result of performing [WB Set] on the IP image as superimposed text.	“OTHER FUNCTION”→“OSD STATUS”→ “OFF”/“ON”

## Live screen [Live]: Multi display mode

The images of a multiple number of devices (Camera Heads/Recorders) can be monitored on one screen (multi screen).

The images of 4 devices or a maximum of 16 devices can be monitored at the same time. When the camera title of any of the images is clicked, the live screen [Live] (single display mode) of the device concerned is displayed as a separate window.

In order to use the multi screen, the devices whose images are to be shown on the multi screen must be set ahead of time.

With one group consisting of 4 cameras, up to four groups of cameras (a total of 16 cameras) can be registered.

(→ 163)



### 1 Multi-screen list box [Multi-screen]

The live screen [Live] display method is selected here.

Single	Displays the IP image of the Camera Head or the unit.
4Split 1/4 Group	Multiple IP images can be viewed on a single screen by configuring the devices for multi-screen display (Camera Heads/Recorders) beforehand in the multi screen setup screen [Multi-screen] (→ 163). (Multi display mode)
4Split 2/4 Group	
4Split 3/4 Group	
4Split 4/4 Group	
16Split	

- The IP videos displayed on the multi screen are JPEG images only.
- IP images are in JPEG format only and audio is not output.
- Images are stretched vertically to fit the [4:3] aspect ratio of the multi screens.
- It is not possible to transfer from the live screen [Live] to the multi screen if the unit's power has been turned off, or the network cable has been disconnected, while IP videos are being displayed.

# Setup from the web screen

## ■ About the backup function for each setup item

The following setup items that can be set with web screen will maintain separate setup values for CAM Mode and SDI Mode.

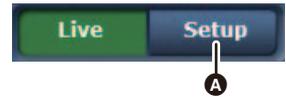
- [Display] under the Clock setting tab [Date&Time] (→ 144)
- All setup items under the Live page tab [Live page] (→ 145)
- All setup items under the IP video settings tab [Video over IP] (→ 148)
- [Audio Transmission] (→ 154) and [Audio bit rate] (→ 154) under the Audio tab [Audio]
- All setup items under the Multi screen setup tab [Multi-screen setup] (→ 163)
- All setup items under the User authentication settings tab [User auth.] (→ 164)
- All setup items under the Network setup tab [Network] (→ 166)
- All setup items under the Advanced network setting tab [Advanced] (→ 169)

## Logging into the Web setup screen [Setup]

1 Turn on the power of the unit from the standby mode state.

2 Click the [Setup] **A** button. (→ 133)

A login screen is displayed.



3 Enter the user name and password.

The factory settings for the user name and password are as follows.

User name	admin
Password	12345

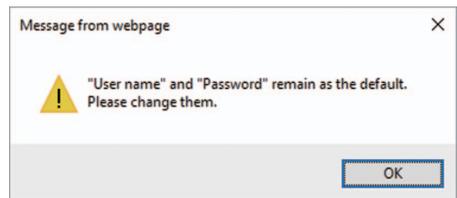
4 Click the [OK] button.

Click [OK] again when the following screen appears.

- While the initial settings remain used for the user name and password, a message prompting the user to change the user name and password is displayed after authorization. In order to ensure security, be sure to change both the user name and password.

It is also recommended that the password be changed at regular intervals.

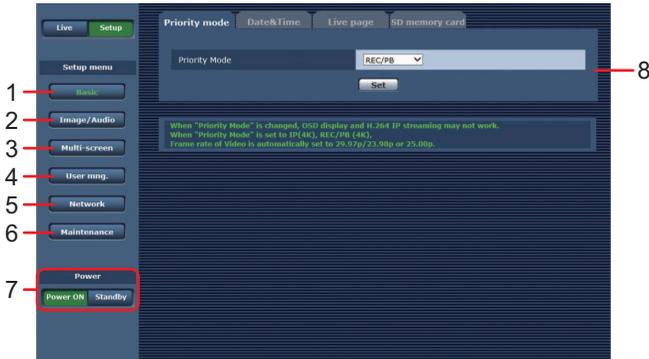
- During Standby mode, the [Setup] button is disabled, and you cannot switch to the web setup screen [Setup].



## Web setup screen [Setup]

The settings for the unit are selected on this screen.

- The setting menu operations can be performed only by users whose access level is “1. Administrator”.  
For the procedure used to set the access level, refer to page 165.



### 1 Basic button [Basic]

When the Basic button is pressed, the Basic screen is displayed in the main area.

- “Basic screen [Basic]” (→ 144)

### 2 Image/Audio button [Image/Audio]

When the Image/Audio button is pressed, the Image/Audio screen is displayed in the main area.

- “Image screen [Image/Audio]” (→ 148)

### 3 Multi-screen button [Multi-screen]

When the Multi-screen button is pressed, the Multi-screen setup screen is displayed in the main area.

- “Multi screen setup screen [Multi-screen]” (→ 163)

### 4 User mng. button [User mng.]

When the User mng. button is pressed, the User mng. screen is displayed in the main area.

- “User management screen [User mng.]” (→ 164)

### 5 Network button [Network]

When the Network button is pressed, the Network setup screen is displayed in the main area.

- “Network setup screen [Network]” (→ 166)

### 6 Maintenance button [Maintenance]

When the Maintenance button is pressed, the Maintenance screen is displayed in the main area.

- “Maintenance screen [Maintenance]” (→ 184)

### 7 Power ON button [Power ON]/Standby button [Standby]

	Turn the unit on.
	Set the unit to Standby mode.

When you enter Standby mode, the display will automatically switch to Live mode. In addition, the [Setup] button in the live screen [Live] will be disabled, and you cannot operate the web setup screen [Setup].

### 8 Main area

The menu screen is displayed.

## Basic screen [Basic]

### ■ Priority mode tab [Priority Mode]

Set the priority output of video.

#### Priority Mode

Configure the setting for the priority output of video.

- This item's setting is reflected when the [Set] button is pressed.

#### Setting value:

IP, REC/PB, IP(4K)\*, REC/PB(4K)\*

Factory settings: REC/PB

- For explanation of each setup value, refer to page 32.

\* Not displayed during SDI Mode.



- When the priority mode is changed, the operation of the mode before the change is forcefully stopped.
- The "IP", "REC/PB", "IP(4K)" and "REC/PB(4K)" mode require various settings to be configured from a personal computer connected via the network.
- This unit cannot display H.264 format 4K images on the Live screen. To display 4K images, use an external device or external software that supports 4K images.

### ■ Clock settings tab [Date&Time]

Configure the settings for the clock. Set the clock using any of the three methods: [PC synchronization], [NTP], and [Manual].

- This item's setting is reflected when the [Set] button is pressed.

#### ● setup

#### Display

Set the display of the date and time on the Live screen.

Factory settings: Off

#### PC synchronization

If you click the [Execute] button, the settings are configured by synchronizing the unit to the date and time of the connected personal computer.

- The time zone of the personal computer is not reflected on the unit.

Set the time zone on the unit.

#### NTP

If you click [NTP>>], the settings screen for the NTP server appears. (→ 170)

#### Manual - Date/time

Configure the settings for the month, day, and year and for the hour, minute, and second.

- The data display format is MMM/DD/YYYY.

- The time is in the 24-hour format.

#### Manual - Time zone

Select the time zone of your region.

- For details, refer to [Time zone table] on page 37.



## ■ Live page tab [Live page]

Configure the setting for the camera title.

### Camera title

Enter the name of the Camera Head or the unit.

When the [Set] button is clicked, the input name appears in the camera title display area.

- By factory default, this is set to the model number of the Camera Head or the unit.
- You can enter between 0 to 20 half-size characters.
- The following characters can be displayed.



Half-size numeric characters	0123456789
Half-size alphabetical characters (upper and lower cases)	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
Symbols	! # \$ % ^ ( ) * + , - . / : ; = ? @ [ ] ^ _ ` {   } ~ ¥

### Automatic installation of viewer software

One of the following settings is selected for the automatic installation of the plug-in viewer software.

**Factory settings:** On

### Smoother live video display on the browser (buffering)

Configure settings for displaying images from the unit on the plug-in viewer software.

**Setting value:**

On	Temporarily store images from the unit onto the personal computer for smoother display. However, the screen display images will be displayed later than the actual images.
Off	Do not temporarily store images from the unit onto the personal computer, and display them in real time. However, the motion of the screen display images may not be smooth.

**Factory settings:** On

## ■ SD card tab [SD memory card]

Configure the format settings for the video to be recorded to an SD card or initialize a card.

- The priority mode needs to be set to "REC/PB" or "REC/PB(4K)". For details, refer to "Priority mode tab [Priority Mode]" (→ 144)

## ● Recording setting

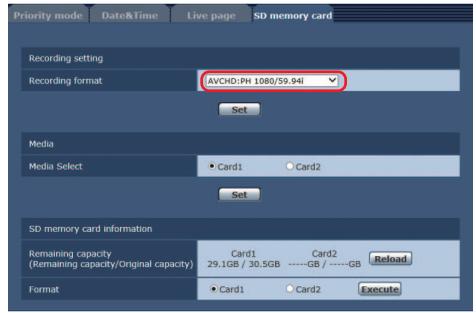
### Recording format

Set the size, frame rate, and bit rate of the video to be recorded to an SD card.

- This item's setting is reflected when the [Set] button is pressed.

**Setting value:**

(When [SYSTEM FREQ] is set to [59.94Hz])



Recording format	Priority Mode
MP4:4K 2160/29.97p 50M, MP4:4K 2160/23.98p 50M	REC/PB(4K)
AVCHD:PS 1080/59.94p, AVCHD:PH 1080/59.94i, AVCHD:PH 1080/23.98p, AVCHD:PH 720/59.94p, AVCHD:HA 1080/59.94i, AVCHD:HE 1080/59.94i, AVCHD:PM 720/59.94p, AVCHD:PH 1080/59.94i FROM 720p*, AVCHD:HA 1080/59.94i FROM 720p*, AVCHD:HE 1080/59.94i FROM 720p*	REC/PB

(When [SYSTEM FREQ] is set to [50.00Hz])

Recording format	Priority Mode
MP4:4K 2160/25.00p 50M	REC/PB(4K)
AVCHD:PS 1080/50.00p, AVCHD:PH 1080/50.00i, AVCHD:PH 720/50.00p, AVCHD:HA 1080/50.00i, AVCHD:HE 1080/50.00i, AVCHD:PM 720/50.00p, AVCHD:PH 1080/50.00i FROM 720p*, AVCHD:HA 1080/50.00i FROM 720p*, AVCHD:HE 1080/50.00i FROM 720p*	REC/PB

\* Can be set only during SDI Mode.

## ● Media

### Media Select

The card slot to record a video can be set.

- The setup is reflected by pressing the [Set] button.

**Setting value:** Card1, Card2

**Factory settings:** Card1

## ● SD memory card information

### Remaining capacity (Remaining capacity/Original capacity)

Displays the remaining capacity and total capacity of the SD card.

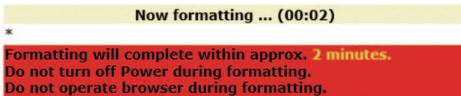
- Capacity is indicated in GB. If a card is not inserted or recognized, “--- GB” is displayed.
- The correct capacity may not be displayed immediately after an SD card is formatted (initialized) or if an SD card is inserted after opening the SD card tab. If that happens, click the [Reload] button.

### Format

A confirmation message is displayed if you select [Card1] or [Card2], and then click the [Execute] button.



When you click the [OK] button, the SD card is formatted (initialized).



- 
- Recording to an SD card is not possible during formatting.
  - If you perform formatting, all of the data stored on the SD card will be deleted.
  - Do not turn off the power of the unit during formatting.

## Image screen [Image/Audio]

### ■ IP video settings tab [Video over IP]

The JPEG image and H.264 image settings as well as the settings related to image quality are selected on this screen.

- This item's setting is reflected when the [Set] button is pressed.

### ● Initial display settings for “Live” page

#### Stream

Select the images to display when the Live screen [Live] is opened.

Setting value:

H.264(1)	Windows	Display videos (H.264(1)).
H.264(2)	Windows	Display videos (H.264(2)).
JPEG(1)		Display still images (JPEG(1)).

Factory settings: H.264(1)

### ● JPEG

#### JPEG(1)

Configure the settings for JPEG images.

#### JPEG transmission

Set whether to transmit JPEG images.

Factory settings: On

#### Image capture size

Resolution of the JPEG image. Displays in [640×360].

#### Refresh interval

Select the frame rate for JPEG images.

Setting value:

(When [SYSTEM FREQ] is set to [59.94Hz])

5fps, 15fps, 30fps

(When [SYSTEM FREQ] is set to [50.00Hz])

5fps, 12.5fps, 25fps

Factory settings:

JPEG(1): 30fps

The screenshot shows the 'Video over IP' configuration page. It is divided into several sections:

- Initial display settings for "Live" page:** A dropdown menu is set to 'H.264(1)'. A 'Set' button is below it.
- JPEG:** A sub-section with a 'Set' button at the bottom. It contains:
  - JPEG transmission:  On  Off
  - Image capture size: 640x360
  - Refresh interval: 30fps
  - Image quality:  Fine  Normal
- H.264(1):** A sub-section with a 'Set' button at the bottom. It contains:
  - H.264 transmission:  On  Off
  - Internet mode (over HTTP):  On  Off
  - Image capture size: 1920x1080
  - Transmission priority: Frame rate
  - Frame rate: 30fps
  - Max bit rate (per client) \*: Max 14336kbps - Min 6144kbps
  - Image quality:  Motion priority  Image quality priority
  - Transmission type: Unicast port (AUTO)
  - Unicast port (Image): 32004 (1024-50000)
  - Unicast port (Audio): 32004 (1024-50000)
  - Multicast address: 239.192.0.39
  - Multicast port: 37004 (1024-50000)
  - Multicast TTL/HOPLimit: 16 (1-254)
- H.264(2):** A sub-section with a 'Set' button at the bottom. It contains:
  - H.264 transmission:  On  Off
  - Internet mode (over HTTP):  On  Off
  - Image capture size: [Dropdown]
  - Transmission priority: Constant bit rate
  - Frame rate: [Dropdown]
  - Max bit rate (per client) \*: Max 512kbps - Min 512kbps
  - Image quality:  Motion priority  Image quality priority
  - Transmission type: Unicast port (AUTO)
  - Unicast port (Image): 32004 (1024-50000)
  - Unicast port (Audio): 32004 (1024-50000)
  - Multicast address: [Input field]
  - Multicast port: 37004 (1024-50000)
  - Multicast TTL/HOPLimit: 16 (1-254)

- The frame rate may be slower depending on the network environment, resolution, image quality, access volume, etc.

### Image quality

Specify the JPEG image quality (2 types) for each resolution.

Setting value: Fine, Normal

Factory settings: Fine

## ● H.264(1)/H.264(2) Windows

Configure the settings for H.264 images.

### H.264 transmission

Whether to transmit the H.264 images is set here.

**Factory settings:** On

#### Internet mode (over HTTP)

This setting is selected when transmitting H.264 images over the Internet.

H.264 images can be transmitted using the same broadband router settings as when transmitting JPEG images.

**Setting value:**

<b>On</b>	The H.264 images and audio are transmitted using the HTTP port. For details on setting the HTTP port number, refer to page 167.
<b>Off</b>	The H.264 images and audio are transmitted using the UDP port.

**Factory settings:** Off

- When [On] is set, only [Unicast port (AUTO)] can be selected as the [Transmission type] setting.
- When [On] is set, it takes a few seconds before the H.264 images are displayed.
- When this is set to [On], H.264 images may not appear depending on the number of users accessing the unit at the same time and whether audio data exists.

### Image capture size

Select the resolution for H.264 images. Selectable options will vary depending on the selected resolution setting.

**Setting value:**

<b>H.264(1)</b>	3840×2160 (This setting is fixed when the [Priority Mode] is [IP(4K)].) 1920×1080, 1280×720, 640×360
<b>H.264(2)</b>	1280×720, 640×360

**Factory settings:**

H.264(1): 1920×1080

H.264(2): 1280×720

### Transmission priority

Set the transmission mode for H.264 images.

**Setting value:**

<b>Constant bit rate</b>	Transmits H.264 images at the bit rate specified in [Max bit rate (per client)]. <ul style="list-style-type: none"><li>• The [Frame rate] value is automatically determined (as 5fps to 30fps or 5fps to 25fps) according to the selected bit rate.</li></ul>
<b>Frame rate</b>	Transmit H.264 images at the frame rate specified in [Frame rate]. <ul style="list-style-type: none"><li>• Set the frame rate and bit rate and transmit.</li></ul>
<b>Best effort</b>	Transmit H.264 images at a variable bit rate between the maximum and minimum specified in [Max bit rate (per client)], according to the network bandwidth. <ul style="list-style-type: none"><li>• Depending on how the bit rate is changed, the [Frame rate] value is automatically determined (as 5fps to 30fps or 5fps to 25fps).</li></ul>

**Factory settings:** Frame rate

- Transmission mode settings are not possible when the [Priority Mode] is set to [IP(4K)].

## Frame rate

Set the frame rate for H.264 images.

### Setting value:

(When [SYSTEM FREQ] is set to [59.94Hz])

5fps, 15fps, 30fps, 60fps

(When [SYSTEM FREQ] is set to [50.00Hz])

5fps, 12.5fps, 25fps, 50fps

### Factory settings:

(When [SYSTEM FREQ] is set to [59.94Hz])

30fps

(When [SYSTEM FREQ] is set to [50.00Hz])

25fps

- 
- When 3840×2160/30fps, 3840×2160/25fps, 1920×1080/60fps or 1920×1080/50fps is used, the setting becomes only H.264(1).
  - When the image resolution is “3840×2160” or “640×360”, 60fps or 50fps cannot be selected for the frame rate.

## Max bit rate (per client)\*1

Specify the H.264 bit rate per client.

When [Transmission priority] is set to [Best effort], specify the maximum and minimum bit rate.

### Setting value:

512kbps, 768kbps, 1024kbps, 1536kbps, 2048kbps, 3072kbps, 4096kbps, 6144kbps, 8192kbps, 10240kbps, 12288kbps, 14336kbps, 16384kbps, 20480kbps, 24576kbps, 32768kbps\*2, 40960kbps\*2, 51200kbps\*2

\*1 The H.264 bit rate is limited by the [Bandwidth control (bitrate)] (→ 168) setting under the [Network] tab of the network setup screen [Network]. The actual bit rate may be lower than the specified value.

\*2 When [IP(4K)] is selected as for the [Priority Mode], this value is fixed to support the frame rate.

### Factory settings:

**H.264(1):** 14336kbps

**H.264(2):** 8192kbps

The range of H.264 bit rates that can be specified varies depending on the resolution.

(When [SYSTEM FREQ] is set to [59.94Hz])

Image capture size	Frame rate	H.264 bit rate
3840×2160	30fps	51200kbps fixed
	15fps	40960kbps fixed
	5fps	32768kbps fixed
1920×1080	60fps	16384kbps to 24576kbps
	5fps, 15fps, 30fps	1024kbps to 14336kbps
1280×720	60fps	3072kbps to 14336kbps
640×360	5fps, 15fps, 30fps	512kbps to 8192kbps
		512kbps to 4096kbps

(When [SYSTEM FREQ] is set to [50.00Hz])

Image capture size	Frame rate	H.264 bit rate
3840×2160	25fps	51200kbps fixed
	12.5fps	40960kbps fixed
	5fps	32768kbps fixed
1920×1080	50fps	16384kbps to 24576kbps
	5fps, 12.5fps, 25fps	1024kbps to 14336kbps
1280×720	50fps	3072kbps to 14336kbps
640×360	5fps, 12.5fps, 25fps	512kbps to 8192kbps
		512kbps to 4096kbps

## Image quality

Select the image quality for H.264 images.

**Setting value:**

<b>Motion priority</b>	Mode giving priority to image motion.
<b>Image quality priority</b>	Mode giving priority to image quality.

**Factory settings:** Motion priority

- This setting is only enabled when [Transmission priority] is set to [Constant bit rate] or [Best effort].

## Transmission type

Select the transmission format for H.264 images.

**Setting value:**

<b>Unicast port (AUTO)</b>	A maximum of 14 users can access a single Camera Head or Recorder at the same time. When transmitting image/audio from a Camera Head or Recorder, [Unicast port (Image)] and [Unicast port (Audio)] are automatically set. We recommend selecting the [Unicast port (MANUAL)] setting when the port number transmitting the H.264 images does not need to be fixed (e.g., during use within a network).
<b>Unicast port (MANUAL)</b>	A maximum of 14 users can access a single Camera Head or Recorder at the same time. When transmitting image/audio from a Camera Head or Recorder, it is necessary to set [Unicast port (Image)] and [Unicast port (Audio)] manually. When transmitting H.264 images via the Internet, configure a fixed transmission port for the broadband router (hereafter referred to as "router") (→ 166). For details, refer to the operating instructions for the router.
<b>Multicast</b>	An unlimited number of users can access a single camera at the same time. When transmitting H.264 images via multicast, enter the [Multicast address], [Multicast port], and [Multicast TTL/HOPLimit].

**Factory settings:** Unicast port (AUTO)

- For explanation of number of maximum simultaneous access, refer to page 133.

## Unicast port (Image)

Enter the unicast port number (used when sending images from the unit).

**Usable port number range:** 1024 to 50000

- Only even numbers can be specified.
- The port number cannot be set to 10670.

**Factory settings:**

**H.264(1):** 32004

**H.264(2):** 32014

## Unicast port (Audio)

**Usable port number range:** 1024 to 50000

- Only even numbers can be specified.
- The port number cannot be set to 10670.

**Factory settings:**

**H.264(1):** 33004

**H.264(2):** 33014

- 
- The unicast port number must be configured when [Transmission type] is set to [Unicast port (MANUAL)].

## Multicast address

Enter the multicast IP address. Images and audio will be sent to the specified IP address.

**Usable values:** 224.0.0.0 to 239.255.255.255

**Factory settings:**

**H.264(1):** 239.192.0.20

**H.264(2):** 239.192.0.21

- 
- Verify usable multicast IP addresses before entering this setting.

## Multicast port

Enter the multicast port number (used when sending images from the unit).

**Usable port number range:** 1024 to 50000

- Only even numbers can be specified.
- The port number cannot be set to 10670.

**Factory settings:** 37004

- 
- When sending audio from the unit, a port number with "1000" added to the multicast port number will be used.

## Multicast TTL/HOPLimit

Enter the TTL/HOPLimit value for multicast.

**Usable values:** 1 to 254

**Factory settings:** 16

- 
- When transmitting H.264 images via the Internet, transmitted images may not appear depending on proxy server settings, firewall settings, etc. In such cases, consult your network administrator.
  - When displaying multicast images on a personal computer with multiple LAN cards installed, disable the LAN cards that are not used for reception.
  - IP control can be performed but if you do not want to perform IP image transmission, set "JPEG transmission", "H.264 transmission" and "Audio Transmission" to "Off". In this case, IP images will also not be displayed on the mobile terminal.

## List of settings for transmission output of IP video

- For details, refer to "Functions that can and cannot be controlled simultaneously" (→ 120) and "About number of pixels/frame rate during SD card recording and IP streaming" (→ 121).

## ■ Audio tab [Audio]

Configure audio settings.

- This item's setting is reflected when the [Set] button is pressed.

- Images and audio are not synchronized. Therefore, images and audio may be slightly out of sync.
- The audio may skip depending on the network environment.

## ● Audio

### Audio Select

The built-in microphone of the Camera Head can be selected during the CAM Mode.

Audio can be recorded by using the microphone of the SDI

output device or connecting an external microphone/audio device during the SDI Mode.

- Content of the setup is the same as the menu [AUDIO SELECT] of this unit. (→ 60)

#### Setting value:

(CAM Mode) Off, Internal Mic

(SDI Mode) Off, SDI, Line, Mic, Plug-in Power Mic

#### Factory settings:

(CAM Mode) Internal Mic

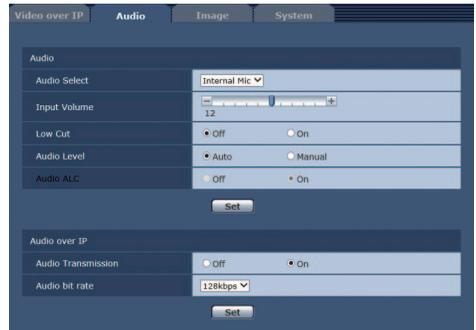
(SDI Mode) SDI

### Input Volume

Set the volume of the audio from the unit when listening to it on the personal computer.

**Setting value:** 0 to 23

**Factory settings:** 12



- 
- When [Audio Level] is set to [Auto], [Input Volume] can be set, but the actual input volume does not change. The adjusted volume will be applied after the [Audio Level] setting is changed to [Manual].

### Low Cut

Reduces the level of the bass.

Sets On/Off.

**Factory settings:** Off

### Audio Level

Switches the adjustment method of Audio Level.

**Setting value:** Auto, Manual

**Factory settings:** Auto

- 
- [Audio Level] cannot be set when [Audio Select] is set to [Off] or [SDI].

### Audio ALC

Turn automatic level adjustment for the audio Off/On.

**Factory settings:** On

- 
- In the following cases, [Audio ALC] will be set to [On], and the setup cannot be changed.
    - When [Audio Select] is set to [Off] or [SDI]
    - When [Audio Level] is set to [Auto]

## ● Audio over IP

### Audio Transmission

Set the communication mode used to transmit audio data to a personal computer, etc.

**Setting value:**

Off	Do not transmit audio data. All settings and controls related to audio will be disabled.
On	Transmit audio data. This allows audio as well as images to be viewed on the personal computer.

**Factory settings:** On

### Audio bit rate

Set the bit rate for transmitting audio.

**Setting value:** 64kbps, 96kbps, 128kbps

**Factory settings:** 128kbps

### ■ Image adjust tab [Image] CAM

Performs the setups regarding the scene file and switch setup.

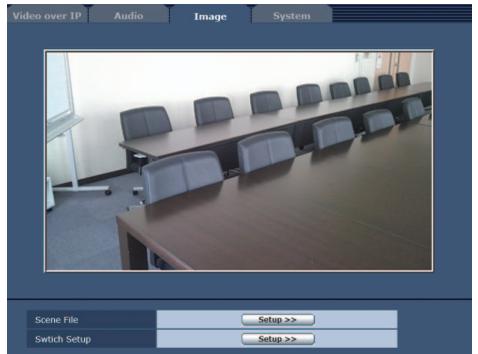
- Not displayed during SDI Mode.

#### Scene File

Clicking the [Setup>>] button displays the scene file setup screen [Scene File]. (→ 155)

#### Switch Setup

Clicking the [Setup>>] button displays the switch setup screen [Switch Setup]. (→ 158)



## ● Scene File setup screen [Scene File]

Perform the setup similar to menu [SCENE FILE] of this unit. To display the picture quality adjustment screen, click the [Setup>>] button for [Scene File] in the picture quality adjustment tab [Image]. The setup contents for items in this screen are immediately reflected.

### Scene Select

Content of the setup is the same as the menu [SCENE FILE] → [SELECT SCENE] of this unit. (→ 43, 200)

**Setting value:** AUTO, F1:, F2:, F3:

**Factory settings:** AUTO

### Detail Level

Content of the setup is the same as the menu [SCENE FILE] → [DETAIL LEVEL] of this unit. (→ 201)

**Setting value:** -10 to +10

**Factory settings:** 0

### V Detail Level

Content of the setup is the same as the menu [SCENE FILE] → [V DETAIL LEVEL] of this unit. (→ 201)

**Setting value:** -7 to +7

**Factory settings:** 0

### Detail Coring

Content of the setup is the same as the menu [SCENE FILE] → [DETAIL CORING] of this unit. (→ 201)

**Setting value:** 0 to 20

**Factory settings:** 0

### Skin Tone DTL

Content of the setup is the same as the menu [SCENE FILE] → [SKIN TONE DTL] of this unit. (→ 202)

**Setting value:** Off, Low, High

**Factory settings:** Off

### WB R Gain

Content of the setup is the same as the menu [SCENE FILE] → [WB R GAIN] of this unit. (→ 202)

**Setting value:** -30 to +30

**Factory settings:** 0

### WB B Gain

Content of the setup is the same as the menu [SCENE FILE] → [WB B GAIN] of this unit. (→ 202)

**Setting value:** -30 to +30

**Factory settings:** 0

### Chroma Level

Content of the setup is the same as the menu [SCENE FILE] → [CHROMA LEVEL] of this unit. (→ 203)

**Setting value:** -70 to +30

**Factory settings:** 0



## Chroma Phase

Content of the setup is the same as the menu [SCENE FILE] → [CHROMA PHASE] of this unit. (→ 203)

**Setting value:** -31 to +31

**Factory settings:** 0

## Matrix

Content of the setup is the same as the menu [SCENE FILE] → [MATRIX] of this unit. (→ 203)

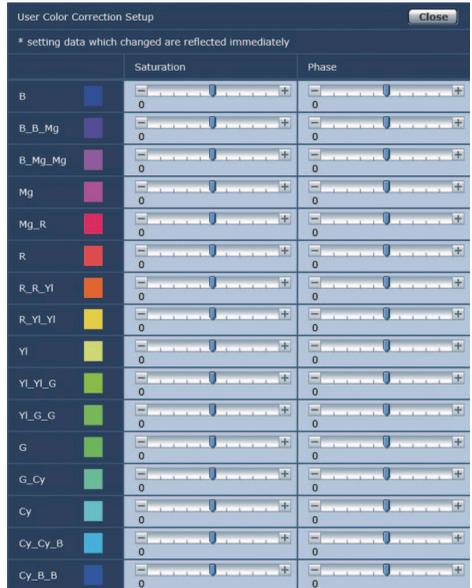
**Setting value:** Norm, Cine-Like, Still-Like

**Factory settings:** Norm

## Color Correction Setting

Content of the setup is the same as the menu [SCENE FILE] → [COLOR CORRECTION SETTING] of this unit. (→ 204)

Click the [Setup>>] button to display the [User Color Correction Setup] screen.



## B to Cy\_B\_B: Saturation

The saturation of B to Cy\_B\_B can be finely adjusted.

**Setting value:** -31 to +31

**Factory settings:** 0

## B to Cy\_B\_B: Phase

The phase of B to Cy\_B\_B can be finely adjusted.

**Setting value:** -63 to +63

**Factory settings:** 0

## Master PED

Content of the setup is the same as the menu [SCENE FILE] → [MASTER PED] of this unit. (→ 205)

**Setting value:** -15 to +15

**Factory settings:** 0

## Gamma

Content of the setup is the same as the menu [SCENE FILE] → [GAMMA] of this unit. (→ 205)

**Setting value:** HD Norm, Cine-Like D, Still-Like

**Factory settings:** HD Norm

## Black Gamma

Content of the setup is the same as the menu [SCENE FILE] → [BLACK GAMMA] of this unit. (→ 205)

**Setting value:** -7 to +7

**Factory settings:** 0

## **Knee**

Content of the setup is the same as the menu [SCENE FILE] → [KNEE] of this unit. (→ 205)

**Setting value:** Auto, Low, Mid, High

**Factory settings:** Auto

## **DRS**

Content of the setup is the same as the menu [SCENE FILE] → [DRS] of this unit. (→ 206)

**Setting value:** Off, Low, Mid, High

**Factory settings:** Off

## **NR Control**

Content of the setup is the same as the menu [SCENE FILE] → [NR CONTROL] of this unit. (→ 206)

**Setting value:** -7 to +7

**Factory settings:** 0

## ● Switch setup screen [Switch Setup]

Perform the setup similar to menu [SW SETUP] of this unit. To display the screen, click the [Setup>>] button for [Switch Setup] in the picture quality adjustment tab [Image].

The setup contents for items in this screen are immediately reflected.

### Backlight COMPENS.

Content of the setup is the same as the menu [SW SETUP] → [BACKLIGHT COMPENS.] of this unit. (→ 68, 207)

**Factory settings:** Off

### Spotlight COMPENS.

Content of the setup is the same as the menu [SW SETUP] → [SPOTLIGHT COMPENS.] of this unit. (→ 68, 207)

**Factory settings:** Off

### ND Filter

Content of the setup is the same as the menu [SW SETUP] → [ND FILTER] of this unit. (→ 80, 207)

**Setting value:** Clear, 1/4, 1/16, 1/64

**Factory settings:** Clear

### Iris Mode

Content of the setup is the same as the menu [SW SETUP] → [IRIS MODE] of this unit. (→ 207)

**Setting value:** Auto, Manual

**Factory settings:** Auto

### Gain Mode

Content of the setup is the same as the menu [SW SETUP] → [GAIN MODE] of this unit. (→ 207)

**Setting value:** Auto, Manual

**Factory settings:** Auto

### Gain

Adjusts the gain value.

**Setup range:** 0 dB to 30 dB

### AGC Limit

Content of the setup is the same as the menu [SW SETUP] → [AGC LIMIT] of this unit. (→ 57, 207)

**Setup range:** 3 dB to 30 dB (in 3 dB steps)

**Factory settings:** 24 dB

### Super Gain

Content of the setup is the same as the menu [SW SETUP] → [SUPER GAIN] of this unit. (→ 57, 207)

**Setting value:** Off, On

**Factory settings:** Off

### Super Gain Effect

Content of the setup is the same as the menu [SW SETUP] → [SUPER GAIN EFFECT] of this unit. (→ 57, 208)

**Setting value:** 33 dB, 36 dB

**Factory settings:** 36 dB

Switch Setup	
Backlight COMPENS.	<input checked="" type="radio"/> Off <input type="radio"/> On
Spotlight COMPENS.	<input checked="" type="radio"/> Off <input type="radio"/> On
ND Filter	Clear ▾
Iris Mode	<input type="radio"/> Auto <input type="radio"/> Manual
Gain Mode	<input type="radio"/> Auto <input type="radio"/> Manual
Gain	<input type="range"/>
AGC Limit	<input type="range"/> 24dB
Super Gain	<input type="radio"/> Off <input type="radio"/> On
Super Gain Effect	<input type="radio"/> 33dB <input checked="" type="radio"/> 36dB
Shutter Mode	<input type="radio"/> Auto <input checked="" type="radio"/> Manual
Shutter Speed	<input type="range"/> Synchro
Synchro Scan	<input type="range"/> 1/60.0
Auto Slow Shutter Limit	1/60 ▾
Auto Shutter Limit	Off ▾
AE Level	<input type="range"/> 0
White Balance Mode	AWB A ▾ <span>WB Set</span>
VAR	<input type="range"/> 3200K
I.Zoom	<input checked="" type="radio"/> Off <input type="radio"/> On
D.Zoom	<input checked="" type="radio"/> Off <input type="radio"/> On
D.Zoom Ratio	x1.4 ▾
O.I.S	<input checked="" type="radio"/> Off <input type="radio"/> On
Hybrid O.I.S Mode	<input checked="" type="radio"/> Off <input type="radio"/> On
Custom O.I.S Setup	<input checked="" type="radio"/> Normal <input type="radio"/> Stationary
Focus	<input type="radio"/> Auto <input checked="" type="radio"/> Manual
Custom AF Stability	<input checked="" type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3
Infrared REC	<input checked="" type="radio"/> Off <input type="radio"/> On
Infrared REC Color	<input checked="" type="radio"/> Green <input type="radio"/> White
Scan Reverse	<input checked="" type="radio"/> Off <input type="radio"/> On

## Shutter Mode

Content of the setup is the same as the menu [SW SETUP] → [SHUTTER MODE] of this unit. (→ 208)

**Setting value:** Auto, Manual

**Factory settings:** Auto

## Shutter Speed

Adjusts the shutter speed.

The shutter speed set in [Synchro Scan] will be set if [Synchro] is set.

**Setup range:** Synchro, 1/2 to 1/8000

**Factory settings:**

- The factory setting varies depending on the frame rate of the recording format.

59.94p/59.94i/29.97p: 1/60

23.98p: 1/48

50.00p/50.00i/25.00p: 1/50

## Synchro Scan

Content of the setup is the same as the menu [SW SETUP] → [SYNCHRO SCAN] of this unit. (→ 59, 208)

- For setup value and setup at the time of shipment, refer to page 208.

## Auto Slow Shutter Limit

Content of the setup is the same as the menu [SW SETUP] → [AUTO SLOW SHUTTER LIMIT] of this unit. (→ 208)

- For setup value and setup at the time of shipment, refer to page 208.

## Auto Shutter Limit

Content of the setup is the same as the menu [SW SETUP] → [AUTO SHUTTER LIMIT] of this unit. (→ 209)

- For setup value and setup at the time of shipment, refer to page 209.

## AE Level

Content of the setup is the same as the menu [SW SETUP] → [AE LEVEL] of this unit. (→ 55, 209)

**Setting value:** -10 to +10

**Factory settings:** 0

## White Balance Mode

Content of the the setup is the same as the menu [SW SETUP] → [WHITE BALANCE MODE] of this unit and the USER button function <ATW LOCK>. (→ 52, 53, 209)

- Performs Auto White Balance if the [WB Set] button is pressed when the White Balance mode is set to [AWB A] or [AWB B].

**Setting value:** ATW, AWB A, AWB B, P3200K, P5600K, VAR, ATW Lock

**Factory settings:** ATW

## VAR

Content of the setup is the same as the menu [SW SETUP] → [VAR] of this unit. (→ 53, 209)

**Setup range:** 2000K to 15000K

**Factory settings:** 3200K

## i.Zoom

Content of the setup is the same as the menu [SW SETUP] → [i.ZOOM] of this unit. (→ 46, 209)

**Setting value:** Off, On

**Factory settings:** Off

## D.Zoom

Content of the setup is the same as the menu [SW SETUP] → [D.ZOOM] of this unit. (→ 68, 209)

**Setting value:** Off, On

**Factory settings:** Off

## D.Zoom Ratio

Content of the setup is the same as the menu [SW SETUP] → [D.ZOOM RATIO] of this unit. (→ 68, 209)

Setting value: ×1.4, ×2, ×4, ×6, ×8

Factory settings: ×1.4

## O.I.S.

Content of the setup is the same as the menu [SW SETUP] → [O.I.S.] of this unit. (→ 210)

Setting value: Off, On

Factory settings: On

## Hybrid O.I.S. Mode

Content of the setup is the same as the menu [SW SETUP] → [HYBRID O.I.S. MODE] of this unit. (→ 47, 210)

Setting value: Off, On

Factory settings: Off

## Custom O.I.S. Setup

Content of the setup is the same as the menu [SW SETUP] → [CUSTOM O.I.S. SETUP] of this unit. (→ 47, 210)

Setting value: Normal, Stationary

Factory settings: Normal

## Focus

Content of the setup is the same as the menu [SW SETUP] → [FOCUS] of this unit. (→ 210)

Setting value: Auto, Manual

Factory settings: Auto

## Custom AF Stability

Content of the setup is the same as the menu [SW SETUP] → [CUSTOM AF STABILITY] of this unit. (→ 49, 210)

Setting value: 1, 2, 3

Factory settings: 1

## Infrared REC

Content of the setup is the same as the menu [SW SETUP] → [INFRARED REC] of this unit. (→ 69, 210)

Setting value: Off, On

Factory settings: Off

## Infrared REC Color

Content of the setup is the same as the menu [SW SETUP] → [IR REC COLOR] of this unit. (→ 210)

Setting value: Green, White

Factory settings: Green

## Scan Reverse

Content of the setup is the same as the menu [SW SETUP] → [SCAN REVERSE] of this unit. (→ 39, 210)

Setting value: Off, On

Factory settings: Off

## ■ System settings tab [System]

This is the setup menu in which the output image settings of the Camera Head or the unit are configured.

- This item's setting is reflected when the [Set] button is pressed.

## ● Others

### Time Stamp **CAM**

The recording date and time can be recorded superimposed on the image.

- Not displayed during SDI Mode.

**Setting value:** Off, On

**Factory settings:** Off

- 
- For time stamp, also refer to page 214.

### CAM/BAR

Switch the display mode of the LCD monitor of the unit and the web screen between the color bar display and the image of the Camera Head or the unit.

- For information about color bars, refer to page 73.

**Setting value:** Camera, Colorbar

**Factory settings:** Camera

### Bars Type

Change the type of color bar to display.

**Setting value:** Type1, Type2

**Factory settings:** Type1

### Test Tone

Volume of the test tone that is output when the color bar is displayed can be adjusted.

**Setting value:** Off, Level1, Level2

**Factory settings:** Off

- 
- For color bar and test tone, also refer to page 73.

### Recorder ID

Sets the recorder ID of this unit.

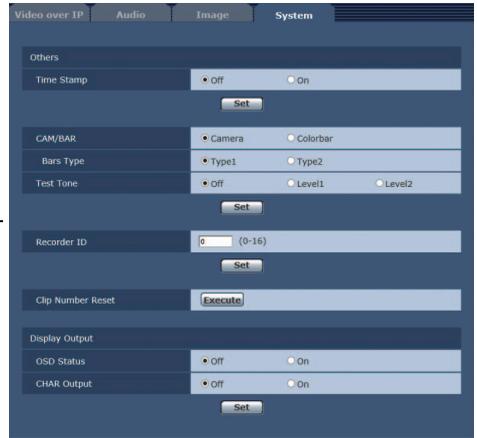
**Setting value:** 0 to 16

**Factory settings:** 0

### Clip Number Reset

Content of the setup is the same as the menu [DISP SETUP] → [CLIP NUMBER RESET] of this unit. (→ 227)

- Executed when the [Execute] button is clicked.



## ● Display Output

### OSD Status CAM

Displays the result of performing [WB Set] on the IP image as superimposed text.

- Not displayed during SDI Mode.

**Setting value:** Off, On

**Factory settings:** Off

### CHAR Output

Content of the setup is the same as the menu [OUTPUT SETUP] → [CHAR OUTPUT] of this unit. (→ [219](#))

**Setting value:** Off, On

**Factory settings:** Off

## Multi screen setup screen [Multi-screen]

The Camera Heads or the units whose images are to be displayed on the multi screen are set here.

### Multi screen setup tab [Multi-screen setup]

This item's setting is reflected when the [Set] button is pressed.

#### IP address

Enter the IP address or the host name of the Camera Head or the unit whose image is to be displayed on the multi screen.

With one group consisting of 4 cameras, up to four groups of cameras (a total of 16 cameras) can be registered. Enter as follows if the HTTP port number has been changed.

Example of input	http://192.168.0.10:8080
------------------	--------------------------

Enter the following when connecting via HTTPS.

Example of input	https://192.168.0.10/
Maximum number of characters	1 to 128 half-size characters

#### Factory settings:

Cam. 1 to Cam. 16: blank

- When connecting via HTTPS, install the security certificate for the Camera Head or the unit to be displayed. (→ 180)
- When configuring a host name, the DNS settings of the personal computer that will display the multi screen must be configured. For details on the personal computer's DNS settings, consult your network administrator.

#### Camera title

Enter the title of the Camera Head or the unit.

The camera title which has been input is displayed on the multi screen.

- You can enter between 0 to 20 half-size characters.
- The following characters can be displayed.

Half-size numeric characters	0123456789
Half-size alphabetical characters (upper and lower cases)	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
Symbols	!# \$ % ^ ( ) * + , - . / : ; = ? @ [ ] ^ _ ` {   } ~ ¥

#### Factory settings:

Cam. 1 to Cam. 16: blank

- When a 16-screen multi screen is selected, camera titles may be only partially displayed.
- Multi screen displays are displayed in 4:3 aspect ratio.

## User management screen [User mng.]

The users and personal computers (IP addresses) that can access the unit from personal computers and mobile terminals are registered in the User mng. screen [User mng.].

### ■ User authentication settings tab [User auth.]

Click the [User auth.] tab of User mng. screen [User mng.]. Configure the user authorization settings for the personal computers and mobile terminals that can access the unit.

- This item's setting is reflected when the [Set] button is pressed.

#### User auth.

User authorization is set to "Off" or "On" here.

Factory settings: Off

#### Authentication

Specify the method of user authentication to use.

Enter the setting using the [Set] button.

Setting value:

<b>Basic</b>	Use basic authentication.
<b>Digest</b>	Use digest authentication.

Factory settings: Basic

- If you change the Authentication setting, close the browser and perform access again.
- We recommend selecting [Digest] to ensure communication security when connecting to a device that supports DIGEST authentication.
- To prevent third parties from identifying user names and passwords, register new user name information (user names and passwords) and delete the default user name information. (→ 130)
- We recommend creating a password of at least 8 characters, including at least 3 types of characters from digits (single-byte), uppercase alphabetic characters (single-byte), lowercase alphabetic characters (single-byte), and special characters.

#### User name [1 to 32 half-size characters]

The user name is input here.

Enter the setting using the [Set] button.

- The following characters can be displayed.

Half-size numeric characters	0123456789
Half-size alphabetical characters (upper and lower cases)	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
Symbols	! # \$ % ^ ( ) * + , - . / = ? @ [ ] ^ _ ` { } ~

## Password

### Retype password [4 to 32 half-size characters]

The password is input here.

Enter the setting using the [Set] button.

- The following characters can be displayed.

Half-size numeric characters	0123456789
Half-size alphabetical characters (upper and lower cases)	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
Symbols	!# \$ % ^ ( ) * + , - . / ; = ? @ [ ] ^ _ `   ~ ¥

## Access level

Select one of the following settings as the user access level.

Enter the setting using the [Set] button.

### Setting value:

1. Administrator	This access level allows the user to perform all the unit's operations.
2. Camera control	This access level allows only Live screen operations to be performed.

Factory settings: 2. Camera control

## User check

You can view registered users by clicking  for [User check].

A registered user is indicated in the form of "Registered user name [Access level]". (Example: admin[1])

To delete a registered user, select the user to be deleted, and click the [Delete] button on the right.

Up to 9 users can be registered as users.

## Network setup screen [Network]

Configure network settings in the Network setup screen.

The Network setup screen consists of the two tabs of [Network] and [Advanced].

- It is possible to perform the network setup of the camera head during the CAM Mode.
- It is possible to perform the network setup of this unit during the SDI Mode.

### ■ Network setup tab [Network]

Click the [Network] tab of the Network setup screen.

This item's setting is reflected when the [Set] button is pressed.

The following information is required to configure network settings. Consult your network administrator or Internet service provider.

- IP address
- Subnet mask
- Default gateway (when using a gateway server or router)
- HTTP port
- DNS primary and secondary server addresses (when using DNS)

### ● IPv4 network

#### DHCP

Whether the DHCP function is to be used is set by selecting "On" or "Off" here. Set the DHCP server in such a way that the same IP address cannot be used by personal computers without the DHCP function or by other network cameras.

For details on the server settings, consult your network administrator.

**Factory settings:** Off

#### IP address(IPv4)

Input the unit's IP address here when the DHCP function is not going to be used. Input an address that will not duplicate an existing IP address which has been set for a personal computer or another network camera.

**Factory settings:** 192.168.0.10

- 
- Multiple IP addresses cannot be used even when the DHCP function is used. For details on the DHCP server settings, consult your network administrator.

#### Subnet mask

Input the unit's subnet mask here if the DHCP function is not going to be used.

**Factory settings:** 255.255.255.0

#### Gateway

Input the unit's default gateway if the DHCP function is not going to be used.

**Factory settings:** 192.168.0.1

- 
- Multiple IP addresses cannot be used for the default gateway even when the DHCP function is used. For details on the DHCP server settings, consult your network administrator.

The screenshot shows the 'Network' tab of the setup screen. It is divided into two main sections: 'IPv4 network' and 'Common'.  
In the 'IPv4 network' section:  
- DHCP is set to 'On'.  
- IP address (IPv4) is 192.168.0.10.  
- Subnet mask is 255.255.255.0.  
- Gateway is 192.168.0.1.  
- DNS is set to 'Auto'.  
- Primary and Secondary DNS fields are empty.  
In the 'Common' section:  
- HTTP port is 80.  
- Max RTP packet size is 'Unlimited(1500byte)'.  
- HTTP max segment size (MSS) is 'Unlimited(1460byte)'.  
- Bandwidth control (bitrate) is 'Unlimited'.  
- Easy IP Setup accommodate period is '20min'.  
- RTSP port is 554.  
A 'Set' button is located at the bottom right of the form.

## DNS

Whether the DNS server address is to be acquired automatically (Auto) or manually (Manual) is input here. If [Manual] has been selected, the DNS settings must be established. If [Auto] is selected when the DHCP function is going to be used, the DNS server address is acquired automatically. For further details, consult your system administrator.

**Setting value:** Auto, Manual

**Factory settings:** Manual

## Primary DNS

## Secondary DNS

Input the IP address of the DNS server if the [Manual] setting has been selected for [DNS].

For details on the IP address of the DNS server, consult your system administrator.

## ● Common

## HTTP port

Port numbers are allocated separately.

**Setting range:** 1 to 65535

The following port numbers are used by the unit so they cannot be used.

20, 21, 23, 25, 42, 53, 67, 68, 69, 110, 123, 161, 162, 443, 554, 995, 10669, 10670, 59000 to 61000

**Factory settings:** 80

## Max RTP packet size

Specify whether to limit the size of RTP packets sent from the Camera Head or the unit when using RTP to view its image.

**Setting value:**

<b>Unlimited(1500byte)</b>	Unlimited (1500 byte)
<b>Limited(1280byte)</b>	Limited (1280 byte)

**Factory settings:** Unlimited(1500byte)

Normally, it is recommended that the [Unlimited(1500byte)] setting be used.

Select [Limited(1280byte)] when the packet size of the used communication line is limited. For details on the maximum packet size of communication lines, consult your network administrator.

## HTTP max segment size(MSS)

Select whether to limit the maximum segment size (MSS) transmitted by the Camera Head or the unit when viewing its image using HTTP.

**Setting value:**

<b>Unlimited(1460byte)</b>	Unlimited (1460 byte)
<b>Limited(1280byte)</b>	Limited (1280 byte)
<b>Limited(1024byte)</b>	Limited (1024 byte)

**Factory settings:** Unlimited(1460byte)

Normally, it is recommended that the default setting be used.

Select [Limited(1024byte)] / [Limited(1280byte)] when the maximum segment size (MSS) of the used communication line is limited. For details on the maximum segment size (MSS) of communication lines, consult your network administrator.

## Bandwidth control (bitrate)

Select the amount of data to be distributed.

### Setting value:

Unlimited, 1024kbps, 2048kbps, 4096kbps, 8192kbps, 16384kbps, 32768kbps

**Factory settings:** Unlimited

## Easy IP Setup accommodate period

Select [20min] or [Unlimited] as the time for enabling the operation of the network settings from the Easy IP Setup Software.

### Setting value:

<b>20min</b>	The setting operations from the Easy IP Setup Software are enabled for 20 minutes after the camera has started operating.
<b>Unlimited</b>	The setting operations from the Easy IP Setup Software are enabled at all times.

**Factory settings:** 20min

## RTSP port

Assign a TCP communication port number used for RTSP initial negotiation.

**Factory range:** 1 to 65535

The following port numbers are used by the unit so they cannot be used.

20, 21, 23, 25, 42, 53, 67, 68, 69, 80, 110, 123, 161, 162, 443, 995, 10669, 10670, 59000 to 61000

**Factory settings:** 554

- The unit also supports general RTSP protocols.  
Listed below are the URLs for RTSP requests.

Request URL	Description
rtsp://<IP address>/mediainput/h264/stream_1	Images set with [H.264(1)] (→ 149) can be requested.
rtsp://<IP address>/mediainput/h264/stream_2	Images set with [H.264(2)] (→ 149) can be requested.

- The following RTSP methods are supported.\*

- OPTIONS
- DESCRIBE
- SETUP
- PLAY
- PAUSE
- GET\_PARAMETER
- TEARDOWN

\* SET\_PARAMETER is not supported. An error will be returned.

## ■ Advanced network setting tab [Advanced]

Click the [Advanced] tab in the network setup screen [Network].

Settings relating to the FTP, NTP, UPnP, and HTTPS functions are performed here.

Click the links to each item to move to the respective setting page.

### ● FTP

Configure settings related to the FTP server.

This item's setting is reflected when the [Set] button is pressed.

- CGI control from an external device is required to use the FTP function.
- The FTP function is not available in the following cases.
  - During PRE-REC or recording
  - While the unit is in Playback Mode or standby mode
  - While a clip is being downloaded from the SD card to the PC (→ 188)
- To use the FTP function, set the priority mode to "REC/PB" or "REC/PB(4K)". For details, refer to "Priority mode tab [Priority Mode]" (→ 144).
- The following operations cannot be performed while data is being transferred to an FTP server.
  - Recording to the SD card
  - Displaying the List screen
  - Switching to Playback Mode or standby mode

The screenshot shows the 'Advanced' tab of the network settings. Under the 'FTP' section, there are input fields for 'FTP server address', 'Directory name', 'User name', and 'Password'. Below these is a 'Control port' field with '21' and '(1-65535)' and radio buttons for 'FTP mode' set to 'Passive' and 'Active'. A 'Set' button is located at the bottom right of the form.

### FTP server address

Enter the IP address or host name of the FTP server to which image data is to be sent.

Maximum number of characters	0 to 128 half-size characters
Characters that can be entered	Half-size alphanumeric characters, half-size symbols : . _ -

**Factory settings:** blank

- To enter the host name of [FTP server address], you need to configure the [DNS] settings on the [Network] tab of the network setup screen [Network]. (→ 167)

### Directory name

Enter the name of the directory to save the video data to be sent.

Maximum number of characters	0 to 256 half-size characters
Characters that can be entered	Half-size alphanumeric characters, half-size symbols However, the following characters cannot be entered. " & :

**Factory settings:** blank

### User name

Enter the user name (login name) for accessing the FTP server.

Maximum number of characters	0 to 32 half-size characters
Characters that can be entered	Half-size alphanumeric characters, half-size symbols ! # \$ % ' ( ) * + , - . / = ? @ [ ] ^ _ ` {   } ~

**Factory settings:** blank

## Password

Enter the password for accessing the FTP server.

Maximum number of characters	0 to 32 half-size characters
Characters that can be entered	Half-size alphanumeric characters, half-size symbols However, the following characters cannot be entered. " &

**Factory settings:** blank

- When you enter a password and click the [Set] button, nothing is displayed in the input field but the setting is complete.

## Control port

Enter the port number for FTP server control.

**Port Nos. that can be selected:** 1 to 65535

The following port numbers are used by the unit so they cannot be used.

20, 23, 25, 42, 53, 67, 68, 69, 80, 110, 123, 161, 162, 443, 554, 995, 10669, 10670, 59000 to 61000

**Factory settings:** 21

## FTP mode

Select the FTP communication mode from Passive mode and Active mode.

**Factory settings:** Active

## ● NTP

Settings relating to the NTP server address and port No. are performed.

This item's setting is reflected when the [Set] button is pressed.

## Synchronization with NTP

Set whether to use an NTP server by selecting "On" or "Off".

**Setting value:**

<b>On</b>	Uses an NTP server. (Synchronizes the date and time with the NTP server.)
<b>Off</b>	Does not use an NTP server.

**Factory settings:** Off

## NTP server address setting

Select the method to acquire the NTP server address.

**Setting value:**

<b>Auto</b>	Acquires the NTP server address from the DHCP server.
<b>Manual</b>	Sets the address by inputting the NTP server address in [NTP server address].

**Factory settings:** Manual



- To acquire the NTP server address from the DHCP server, you need to set "DHCP" (→ 166) of "IPv4 network" on the [Network] tab of the network setup screen [Network] to "On".

## NTP server address

When [Manual] is selected in the [NTP server address setting], input the IP address or host name of the NTP server.

Maximum number of characters	0 to 128 half-size characters
Characters that can be entered	Half-size alphanumeric characters, half-size symbols : . _ -

**Factory settings:** blank

- To input the [NTP server address] host name, the [DNS] setting must be selected on the [Network] tab of the network setup screen [Network] (→ 167).

## NTP port

Input the port No. of the NTP server.

**Port Nos. that can be selected:** 1 to 65535

The following port numbers are used by the unit so they cannot be used.

20, 21, 23, 25, 42, 53, 67, 68, 69, 80, 110, 161, 162, 443, 554, 995, 10669, 10670, 59000 to 61000

**Factory settings:** 123

## Time adjustment interval

Selects the interval (1 to 24 hours in 1-hour increments) for acquiring the time from the NTP server.

**Factory range:** 1h to 24h

**Factory settings:** 1h

## ● UPnP

This unit supports UPnP (Universal Plug and Play). Using the UPnP function allows the following to be set automatically. This item's setting is reflected when the [Set] button is pressed.

- Sets the router's port forwarding function. (However, a UPnP-compatible router is necessary.)  
This setting is useful when accessing the Camera Head or the unit from the internet or a mobile terminal.



## Auto port forwarding

Whether to use the router's port forwarding function is set by selecting "On" or "Off".

To use the automatic port forwarding function, the used router must support UPnP and the UPnP function must be enabled.

**Factory settings:** Off

- The port number may be changed by automatic port forwarding. If the number is changed, the port No. of the Camera Head or the unit registered to the PC or the unit must be changed.
- To confirm that automatic port forwarding is correctly set, click the [Status] tab in the maintenance screen [Maintenance] to confirm that the [UPnP] status is set to [Enable]. (→ 185)  
If [Enable] is not displayed, refer to "No access is possible from the web browser" in the "Troubleshooting" (→ 246).

## ● HTTPS

Using the HTTPS function enables access to the Camera Head or the unit to be encrypted and communication security to be enhanced.

See page 174 for more details on the HTTPS setup method.

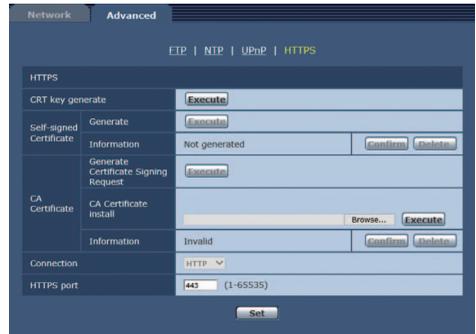
This item's setting is reflected when the [Set] button is pressed.

### CRT key generate

A CRT key (SSL encryption key) is generated by HTTPS.

To generate a CRT key, click the [Execute] button to display the [CRT key generate] dialog.

For more details, refer to "Generating a CRT key (SSL encryption key) [CRT key generate]" (→ 175)



### Self-signed Certificate - Generate

A self-signed security certificate is generated by HTTPS. (Self-signed Certificate)

To generate a self-signed certificate (security certificate), click the [Execute] button to display the [Self-signed Certificate - Generate] dialog and perform the operation.

For more details, refer to "Generating a self-signed certificate [Self-signed Certificate - Generate]" (→ 176).

### Self-signed Certificate - Information

This displays information relating to the self-signed certificate (security certificate).

When the [Confirm] button is clicked, the registered content of the generated self-signed certificate (security certificate) is displayed in the [Self-signed Certificate - Confirm] dialog.

Click the [Delete] button to delete the generated selfsigned certificate (security certificate).

### CA Certificate - Generate Certificate Signing Request

When using a security certificate issued by the Certificate Authority (CA) as a security certificate for HTTPS, a Certificate Signing Request (CSR) is generated for application to the Certificate Authority (CA).

To generate a Certificate Signing Request (CSR), click the [Execute] button to display the [CA Certificate - Generate Certificate Signing Request] dialog and perform the operation.

For more details, refer to "Generating a Certificate Signing Request (CSR) [CA Certificate - Generate Certificate Signing Request]" (→ 177).

### CA Certificate - CA Certificate install

This displays information relating to server certificates (security certificates) issued by the Certificate Authority (CA), which are to be or are already installed.

In the dialog screen that appears by clicking the [Browse] button, select the file of the server certificate (security certificate) issued by the Certificate Authority (CA) and click the [Execute] button to install the server certificate (security certificate).

If the server certificate (security certificate) is installed, its file name will be displayed.

For more details, refer to "Installing a Server Certificate [CA Certificate - CA Certificate install]" (→ 178).

### CA Certificate - Information

This displays information relating to the server certificate (security certificate).

When the [Confirm] button is clicked, the registered content of the installed server certificate (security certificate) is displayed in the [CA Certificate - Confirm] dialog. If the server certificate (security certificate) is not installed, the content of the generated Certificate Signing Request (CSR) is displayed.

Click the [Delete] button to delete the installed server certificate (security certificate).

- To delete an enabled server certificate (security certificate), confirm that there is a backup to the said certificate in your personal computer or recording media. A server certificate (security certificate) will be needed to reinstall it.

## Connection

This sets the method to connect to the unit.

### Setting value:

<b>HTTP</b>	Only HTTP connection is possible.
<b>HTTPS</b>	Only HTTPS connection is possible.

### Factory settings: HTTP

For more details, refer to "Setting the Connection Method [Connection]" ([→ 179](#)).

- 
- When using an HTTPS connection, network connection with the AW-RP50, AW-RP120, and AK-HRP200 will be disabled.

## HTTP port

This sets the Port No. to be used with HTTPS.

### Port Nos. that can be selected: 1 to 65535

The following port numbers are used by the unit so they cannot be used.

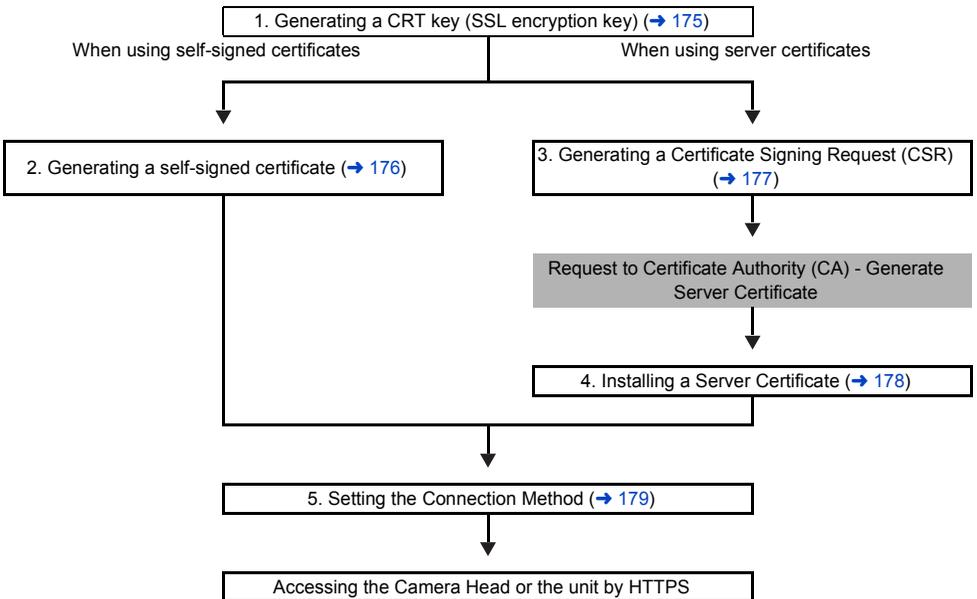
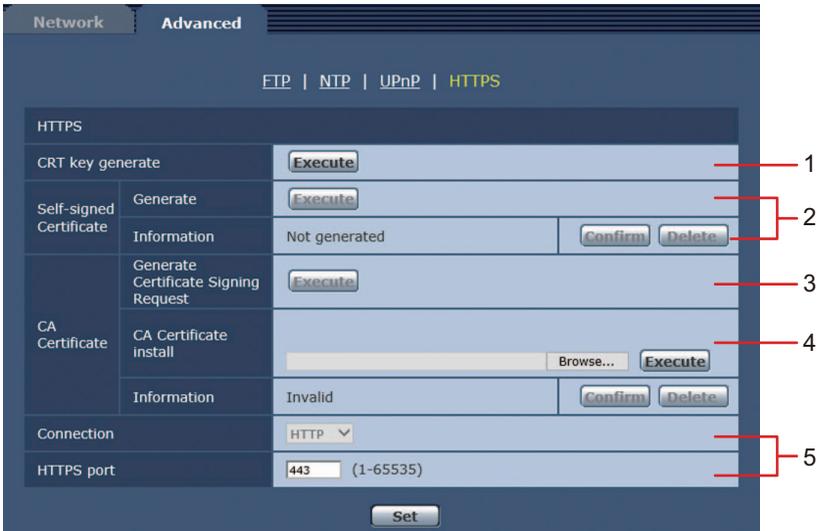
20, 21, 23, 25, 42, 53, 67, 68, 69, 80, 110, 123, 161, 162, 554, 995, 10669, 10670, 59000 to 61000

### Factory settings: 443

- 
- This unit will restart if the connection method is changed.
  - When using a self-signed certificate:  
A warning screen is displayed when accessing the Camera Head or the unit by HTTPS for the first time. Install the self-signed certificate (security certificate) in your PC in accordance with the screen instructions. ([→ 180](#))
  - When using a server certificate:  
Install the Certificate Authority (CA) root certificate or intermediate certificate in your web browser in advance.  
Follow the Certificate Authority (CA) procedures to acquire and install root certificates and intermediate certificates.
  - When accessing the Camera Head or the unit by HTTPS, the image display speed and frame rate of the moving image may reduce.
  - When accessing the Camera Head or the unit by HTTPS, it may take some time for the images to be displayed.
  - When accessing the Camera Head or the unit by HTTPS, images may be disturbed and sound may be interrupted.
  - The maximum number of Camera Heads or units that can be connected simultaneously depends on the maximum image size and distribution format.

## ■ HTTPS settings [HTTPS]

This encrypts access to the Camera Head or the unit and sets HTTPS to enhance communication security. Setting HTTPS is performed by following the procedures below.



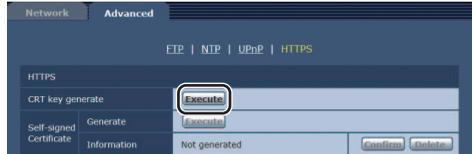
- When using a server certificate, the process from applying to the Certificate Authority (CA) to issuing a server certificate must be performed between customers and the Certificate Authority (CA).
- Use either a self-signed certificate or server certificate. When simultaneously generating a self-signed certificate and installing a server certificate, this unit will prioritize the server certificate.

## ■ Generating a CRT key (SSL encryption key) [CRT key generate]

- A CRT key cannot be generated when self-signed certificates and server certificates are enabled.
- The size of the key that can be used by the Certificate Authority (CA) differs when using a server certificate. Confirm in advance the size of the key that can be used.
- It takes about 2 minutes to generate a CRT key.  
Do not operate the web browser until CRT key generation is complete. Image display and communication speed may reduce while generating a CRT key.

### 1 Click the [Execute] button.

- The [CRT key generate] dialog is displayed.



### 2 Click the [Execute] button.

- CRT key generation starts.
- After CRT key generation is complete, pressing the [Execute] button in [Current CRT key] will display the size of the CRT key generated by the [Current CRT key] and the date and time the generation concluded.



- When using a server certificate, the RSA key size must be in accordance with the demands of the Certificate Authority (CA) which will be applied to.
- Perform procedures 1 to 2 to change (update) the generated CRT key. Because the CRT key, selfsigned certificate and server certificate are enabled as a set, it will be necessary to once again generate a self-signed certificate or apply for a server certificate when the CRT key is changed.
- When the CRT key is changed, previous CRT keys are historically managed one at a time. Clicking the [History] button in the [Current CRT key] of the [CRT key generate] dialog displays the [Previous CRT key] dialog, allowing confirmation of the key size and the date and time generation was completed. Clicking the [Apply] button in [Previous CRT key] allows the previous CRT key to be switched to the current CRT key.



## ■ Generating a self-signed certificate [Self-signed Certificate - Generate]

- A self-signed certificate cannot be generated when a CRT key has not been generated.

### 1 Click the [Execute] button in [Self-signed Certificate - Generate].

- [Self-signed Certificate - Generate] is displayed.

### 2 Input information relating to the certificate to be generated.

- Items to be entered are as follows.

Item	Description	Maximum number of characters
Common Name	Inputs the IP address or the host name of the Camera Head or the unit.	64 half-size characters
Country	Inputs the country code. (can be abbreviated)	2 half-size characters: country code
State	Inputs the name of the state. (can be abbreviated)	128 half-size characters
Locality	Inputs the name of the city. (can be abbreviated)	128 half-size characters
Organization	Inputs the name of the organization. (can be abbreviated)	64 half-size characters
Organizational Unit	Inputs the name of the organizational unit. (can be abbreviated)	64 half-size characters
CRT key	Displays the size of the current CRT key and the date and time generation was completed.	—

- Characters that can be input for [Common Name], [Country], [State], [Locality], [Organization], [Organizational Unit] are 0 to 9 (half-size characters), A to Z (half-size characters), a to z (half-size characters), and the following half-size symbols: -, \_, + / ( ).
- When connecting the Camera Head or the unit to the internet, set the address or host name to be accessed from the internet in [Common Name].  
In this case, when accessing the camera locally, a security warning screen is displayed every time the camera is accessed even when a security certificate is installed.

### 3 Click the [OK] button after inputting the address.

- A self-signed certificate is generated.

- Information relating to the generated self-signed certificate is displayed in [Self-signed Certificate] - [Information]. The following is displayed depending on the status of the self-signed security certificate.

Displayed content	Description
Not generated	When the self-signed certificate is not generated
Invalid (Reason: CA Certificate installed)	When the self-signed certificate is already generated and the server certificate is already installed <ul style="list-style-type: none"> <li>• The server certificate is enabled in this case.</li> </ul>
[Common Name] of self-signed certificate	When the self-signed certificate is already generated and enabled

- When the [Confirm] button is clicked, the registered content of the generated self-signed certificate (security certificate) is displayed in the [Self-signed Certificate - Confirm] dialog.



- Click the [Delete] button to delete the generated self-signed certificate (security certificate).
- When [HTTPS] is selected in [Connection], the selfsigned certificate (security certificate) cannot be deleted.

## ■ Generating a Certificate Signing Request (CSR) [CA Certificate - Generate Certificate Signing Request]

- A certificate signing request (CSR) cannot be generated if a CRT key has not been generated.
- To generate a certificate signing request (CSR), perform the following settings in advance in the web browser Internet options. Perform the following settings in the [Security] tab (accessed from [Tools] in the menu bar - [Internet Options] - [Security]).
  - Add the Camera Head or the unit to [Trusted Sites].
  - In [Level Customize], go to [File Download] from [Download] and set to [Enable].
  - In [Level Customize], go to [Automatically Display Dialog when Downloading File] from [Download] and set to [Enable].

### 1 Click the [Execute] button in [CA Certificate - Generate Certificate Signing Request].

- The [CA Certificate - Generate Certificate Signing Request] dialog is displayed.



### 2 Input information relating to the certificate to be generated.

- Items to be entered are as follows.

Item	Description	Maximum number of characters
Common Name	Inputs the IP address or the host name of the Camera Head or the unit.	64 half-size characters
Country	Inputs the country code.	2 half-size characters: country code
State	Inputs the name of the state.	128 half-size characters
Locality	Inputs the name of the city.	128 half-size characters
Organization	Inputs the name of the organization.	64 half-size characters
Organizational Unit	Inputs the name of the organizational unit.	64 half-size characters
CRT key	Displays the size of the current CRT key and the date and time generation was completed.	—

- When using a server certificate, the information to be input must be in accordance with the demands of the Certificate Authority (CA), which will be applied to.
- Characters that can be input for [Common Name], [Country], [State], [Locality], [Organization], [Organizational Unit] are 0 to 9 (half-size characters), A to Z (half-size characters), a to z (half-size characters), and the following half-size symbols: -, \_, + / ( ).

**3 Click the [OK] button after inputting the address.**

- The [Save As] dialog is displayed.

**4 In the [Save As] dialog, assign a file name to the Certificate Signing Request (CSR) and save it in personal computer.**

- Apply to the Certificate Authority (CA) using the saved Certificate Signing Request (CSR).

- A server certificate is issued for both the generated Certificate Signing Request (CSR) and CRT key. The issued server certificate can no longer be used when generating/updating the CRT key after applying to the Certificate Authority (CA).
- The Certificate Signing Request (CSR) generated by this unit is in a PEM format.

**■ Installing a Server Certificate [CA Certificate - CA Certificate install]**

- A server certificate (security certificate) cannot be installed if a Certificate Signing Request (CSR) has not been generated.
- The server certificate must have been issued by the Certificate Authority (CA) in order to install it.

**1 Click the [Browse] button in [CA Certificate - CA Certificate install].**

- A dialog screen is displayed.

**2 Select the server certificate file and click [Open]. Then click the [Execute] button.**

- The server certificate is installed.

- The name of the host registered to the installed server certificate is displayed in [CA Certificate] - [Information]. The following is also displayed depending on the status of the server certificate.

Displayed content	Description
Invalid	When the server certificate is not installed
[Common Name] of server certificate	When the server certificate is already installed and enabled
Expired	When the effective period of the server certificate has expired

- When the [Confirm] button is clicked, the content of the installed server certificate (security certificate) is displayed in the [CA Certificate - Confirm] dialog. (An asterisk is displayed in the [Organizational Unit] field only.)
- Click the [Delete] button to delete the installed server certificate (security certificate).
- When [HTTPS] is selected in [Connection], the server certificate (security certificate) cannot be deleted.
- Perform STEP 1 to 2 to update a server certificate.
- To delete an enabled server certificate (security certificate), confirm that there is a backup to the said certificate in your personal computer or recording media. A server certificate (security certificate) will be needed to reinstall it.
- The HTTPS function can no longer be used when the effective period of the server certificate has expired. In such a case, the connection method is changed to HTTP when the unit is restarted. Update the server certificate before its effective period expires.
- The effective period of the server certificate can be confirmed by double-clicking the server certificate file issued by the Certificate Authority (CA).

## ■ Setting the Connection Method [Connection]

### 1 Set the method to access the Camera Head or this unit in [Connection].

HTTP	Only HTTP connection is possible.
HTTPS	Only HTTPS connection is possible.

- When using an HTTPS connection, network connection with the AW-RP50, AW-RP120, and AK-HRP200 will be disabled.

### 2 Set the Port No. to be used with HTTPS in [HTTPS Port].

- **Port Nos. that can be selected:** 1 to 65535

The following port numbers are used by the unit so they cannot be used.

20, 21, 23, 25, 42, 53, 67, 68, 69, 80, 110, 123, 161, 162, 554, 995, 10669, 10670, 59000 to 61000

**Factory settings:** 443

### 3 Click the [Set] button.

- The Camera Head or this unit restarts and access to the Camera Head or this unit via HTTPS is enabled.

- 
- This unit will restart if the connection method is changed.

#### ● Using a self-signed certificate

A warning screen is displayed when accessing the Camera Head or this unit by HTTPS for the first time. Install the self-signed certificate (security certificate) in your personal computer in accordance with the screen instructions.

(→ 180)

#### ● Using a server certificate

Install the Certificate Authority (CA) root certificate or intermediate certificate in your web browser in advance.

Follow the Certificate Authority (CA) procedures to acquire and install root certificates and intermediate certificates.

- When accessing the Camera Head or this unit by HTTPS, the image display speed and frame rate of the moving image may reduce.
- When accessing the Camera Head or this unit by HTTPS, it may take some time for the images to be displayed.
- When accessing the Camera Head or this unit by HTTPS, images may be disturbed and sound may be interrupted.
- The maximum number of Camera Heads or units that can be connected simultaneously depends on the maximum image size and distribution format.

## ■ Accessing the Camera Head or this unit by HTTPS

### 1 Launch the web browser in your personal computer.

### 2 Enter the IP address of the Camera Head or the unit in the address bar of the web browser.

- Example of input: `https://192.168.0.10/`

- When the HTTPS port No. is changed from "443", enter "https://<IP address of the Camera Head or the unit>:<Port No.>" in the address bar.

E.g. `https://192.168.0.11:61443`

- When this unit is in a local network, set a proxy server from the web browser (menu bar: [Tools] - [Internet Options]) to ensure that a proxy server is not used for a local address.

### 3 Press the [Enter] key.

- The Live screen is displayed.
- The security certificate is installed when the security warning screen is displayed. (→ 180)
- When [User auth.] is set to [On], the user name and password input screen is displayed before the live screen appears.

- 
- When HTTPS is used, screen and image display may slow down and image update interval (frame rate) may also slow down.

## ● Install the security certificate

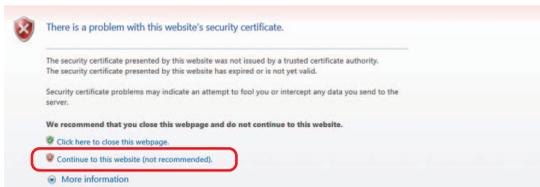
When using HTTPS to access the Camera Head or this unit, the security warning screen will be displayed if the security certificate of the said Camera Head or this unit has not been installed in your personal computer. To prevent this warning screen being displayed, the security certificate must be installed in accordance with the following procedures. If it is not installed, the security warning screen will be displayed every time the camera is accessed.

- The security certificate will be installed to your personal computer based on the content set for [Common Name]. The content set for the "Host Name" must therefore match that set for the address/host name used to access the Camera Head or this unit. If the content differs, a security warning screen will be displayed every time the camera is accessed.
- A security warning screen will be displayed if the Camera Head or this unit address/host name is changed even when a security certificate has been installed. Reinstall the security certificate.
- When connecting the camera to the Internet, set the address or host name to be accessed from the Internet in [Common Name]. In this case, when accessing the camera locally, a security warning screen is displayed every time the camera is accessed even when a security certificate is installed.

### 1 Accessing the Camera Head or this unit by HTTPS

### 2 When the security warning screen is displayed, click [Continue to this website (not recommended)].

- The live screen [Live] is displayed.  
When the authentication screen is displayed, input the user name and password.



- When the above screen is displayed after accessing a device apart from the Camera Head or the unit or a website whose address is not the address specified for the Camera Head or the unit, there may be a security problem, so please be careful.

### 3 Click [Certificate error] in the URL and then click [View certificates].



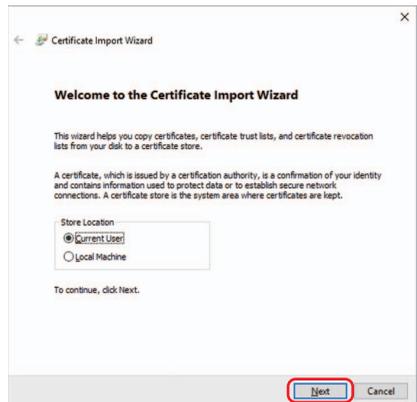
#### 4 Click [Install Certificate...].

- If [Install Certificate...] is not displayed, close Internet Explorer and restart it by selecting [Run as Administrator]. Right-click on [Start] - [Program] - [Internet Explorer] and click [Execute as Administrator (A)...].

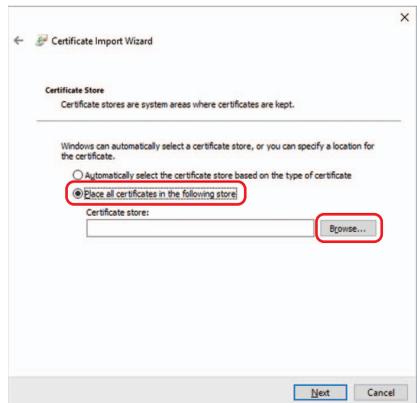


#### 5 Click [Next], which is displayed in the certificate import wizard.

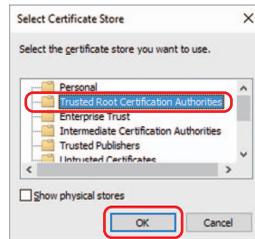
- In the case of Internet Explorer 11, select the [Save destination] and click [Next].



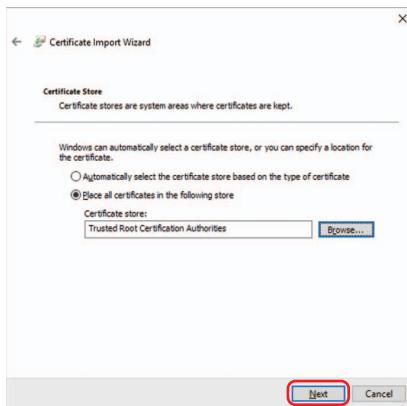
#### 6 Select [Place all certificates in the following store] and click [Browse].



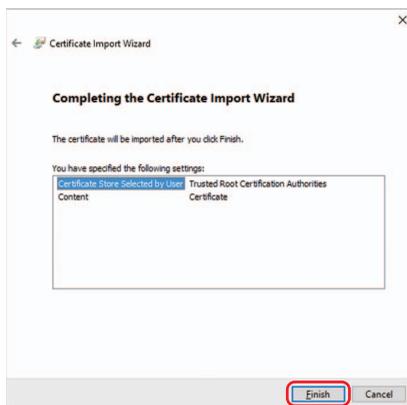
7 Select [Trusted Root Certification Authorities] and click [OK].



8 Click [Next].

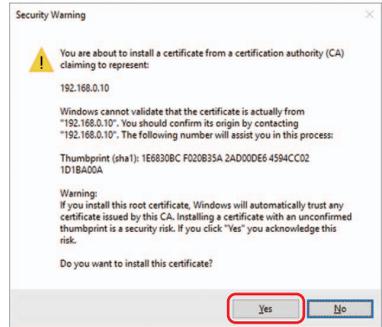


9 Click [Finish].



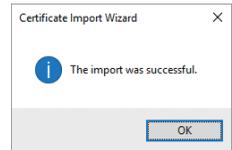
**10 Click [Yes].**

- When importing is finished, the “The import was successful.” screen is displayed.



**11 Click [OK].**

- Closing the web browser after importing the certificate and reconnecting to it will stop the “Certificate error” screen being displayed.



## Maintenance screen [Maintenance]

Among the various maintenance operations performed on this screen are system log checks, system version upgrading and initialization of the unit.

The Maintenance screen consists of five tabs: [System log], [Product info.], [Status], [Default reset] and [Backup].

### ■ System log tab [System log]

Up to 300 event logs can be saved to the internal memory of the unit.

When this maximum number has been exceeded, the old logs are overwritten successively by the new logs.

The logs are maintained even if the unit's power is turned off.

#### No

Displays the log sequence numbers.

"1" indicates the latest information, and up to 300 logs can be saved.

#### Date & Time

Displays the dates and times when the events occurred.

The dates and times when the events occurred are indicated in 24-hour format according to the clock of the unit.

#### Event code

Displays the event code numbers.

#### Description

Displays the event descriptions.

Display examples:

- Rec stop.
- Rec start.
- Slot1 NO CARD.
- Recorder power on.



No	Date & Time	Event code	Description
1	DEC/15/2017 15:31	W1101	<SD Card> Slot1 NO CARD.
2	DEC/15/2017 15:31	W1101	<SD Card> Slot1 NO CARD.
3	DEC/15/2017 15:30	W1106	<SD Card> Rec stop.
4	DEC/15/2017 15:30	W1105	<SD Card> Rec start.
5	DEC/15/2017 15:30	W0001	<Power> Recorder system start.

### ■ Product information tab [Product info.]

The versions of the unit's software can be checked on this screen.

The [Model no.], [MAC address], [Serial no.], [Firmware version] and other information about the unit are displayed.

#### Model no.

The unit's model number is displayed here.

#### MAC address

The unit's MAC address is displayed here.

#### Serial no.

The unit's serial number is displayed here.

#### Firmware version

This displays the unit's firmware version.

#### Operation time

Display the unit's total operating time. (Up to 99999h)

#### OSS license display

When you press the [View] button, the OSS license appears.

Press the [Close] button to close the OSS license display screen.



System log	Product info.	Status	Default reset	Backup
Model no.	W1101			
MAC address	00:00:00:00:00:00			
Serial no.	00000000			
Firmware version	00.00.00.00			
Operation time	000			
OSS license display	<input type="button" value="View"/>			

## ■ Status confirmation tab [Status]

Confirm the status of the unit.

### ● UPnP

#### Port number(HTTP)

Displays the port number configured via UPnP port forwarding.

##### Status

Displays the port forwarding status.

#### Port number(HTTPS)

Displays the port number configured via UPnP port forwarding.

##### Status

Displays the port forwarding status.

#### Router global address

Displays the global address of the router.



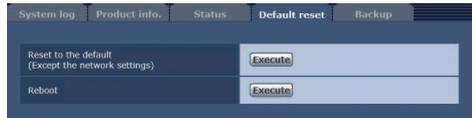
## ■ Reset settings tab [Default reset]

The unit's setting data is initialized and the unit is restarted on this screen.

### Reset to the default (Except the network settings)

The setup content of this unit is reset to the initial setup,

and this unit is rebooted by clicking on the [Execute] button. However, the following setup contents are not initialized.



- All the settings under [Setup] → [Basic] → [Date&Time]
- All the settings under [Setup] → [Multi-screen]
- All the settings under [Setup] → [User mng.]
- All the settings under [Setup] → [Network]
- All the settings under [Setup] → [Maintenance]
- Setup of [SYSTEM FREQ] and [LANGUAGE]
- Setup of [SCENE FILE] (only during SDI Mode)

When the initialization operation is started, no operations can be undertaken for about 1 minute.

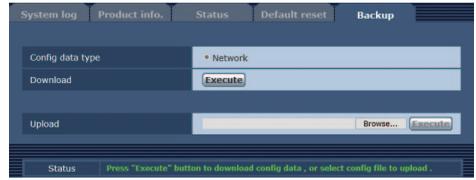
### Reboot

When the [Execute] button is clicked, the unit is rebooted.

After the unit has been rebooted, no operations can be undertaken for about 1 minute as is the case when the unit's power is turned on.

## ■ Back up tab [Backup]

On this screen, the unit's settings can be saved to a personal computer or settings saved in a personal computer can be loaded into the unit for use.



### Config data type

Specify the type of settings to save when saving the unit's configuration data on the personal computer.

**Setting value:**

<b>Network</b>	<ul style="list-style-type: none"> <li>● Setup content of user file</li> <li>● Network settings</li> </ul>
----------------	--

### Download

Save the unit's settings onto the personal computer.

When the destination dialog box appears after clicking the [Execute] button, specify the destination folder.

When [Network] is selected in [Config data type], the following settings are saved.

File name	Settings
(During CAM Mode) AG-UCK20_NSetting.dat	Settings of the Web screen
(During SDI Mode) AG-UMR20_NSetting.dat	Clock settings Network settings

● The user file backup items, web screen settings, and network settings of the unit will be saved. Please note that the web screen settings and network settings will be saved separately for CAM Mode and SDI Mode.

- After the [Execute] button is clicked, the amount of time it takes for the destination dialog box to appear is about 20 seconds for a network settings file.
- The unit may restart after download of settings files.
- Depending on the state of the unit (whether recording to the SD card is in progress), settings file downloading may not be possible. The unit will also restart automatically in such cases.

### Upload

The unit's setting files, which were saved in the personal computer by the download function, are uploaded.

Click the [Browse] button to display the dialog box, and specify the saved file.

When you click the [OK] button in the message dialog box that appears after you click the [Execute] button, uploading starts. Another message dialog box appears after uploading is complete. When you click the [OK] button, the unit will restart automatically.

- Use the files downloaded by the unit as the data to be used for uploading.
- If the file name of a settings file is changed, it may become impossible to upload.
- Do not turn off the unit's power while downloading or uploading is underway.
- Do not attempt to perform any operations while downloading or uploading is underway. Instead, wait until the downloading or uploading is completed.
- It takes about 2 minutes for the upload complete dialog box to appear for the settings files of the Camera Head or the unit.

# Record to SD card

MP4 or AVCHD clip can be saved to SD card by remotely controlling this unit.

- For compatible SD card, refer to page 27.
- Set the priority mode to “REC/PB” or “REC/PB(4K)” before use. For details, refer to “Priority mode tab [Priority Mode]” (→ 144)
- IP control and IP video transmission can be used at the same time as these functions if you use a LAN cable. However, some limitations will occur to IP video transmission compared with when the priority mode is set to “IP”. For details, refer to “Switching the priority mode”/“Priority mode tab [Priority Mode]” (→ 32, 144).
- When the priority mode is “REC/PB(4K)”, the IP transmission of H.264 images is not possible.

## Recording

When an SD card that has been used with another device is to be used with the unit for the first time, format (initialize) the SD card before use. Furthermore, when a commercially available SD card is to be used for the first time, be sure to format (initialize) it with the unit.

For details, refer to “Format” (→ 147).

- 1 Select the media to record.**
  - For details, refer to [Media Select] (→ 146).
- 2 Set the priority mode to “REC/PB” or “REC/PB(4K)”.**
  - “Priority mode tab [Priority Mode]” (→ 144)
- 3 Set the format for the video to be recorded.**
  - “SD card tab [SD memory card]” (→ 146)
- 4 Click [Live] on the Web screen and then click [Other Menu >>].**



- 5 Start and stop recording by clicking the [Rec] button and [Stop] button of the [SD Card Operation] item.**
  - When recording starts, the SD access lamp on the top right of the screen is displayed in red.



- When the SD access lamp is displayed red, recording is not possible because the SD card is being accessed
- The following operations are not possible during recording.
  - Menu operation on the web screen
  - Display of the Camera Text Menu
  - Changing the Scene Selection [Scene] setting (→ 138)
  - Switching to web setup screen [Setup]
- If the web screen is updated during recording, display becomes the Other menu of the Live screen.

## Downloading a file

The clip recorded in the SD card can be downloaded from the List screen.

- 1 Click the [List] button in the [SD Card Operation] item.



- The clip is displayed in the List screen in the order of when the recording is started.

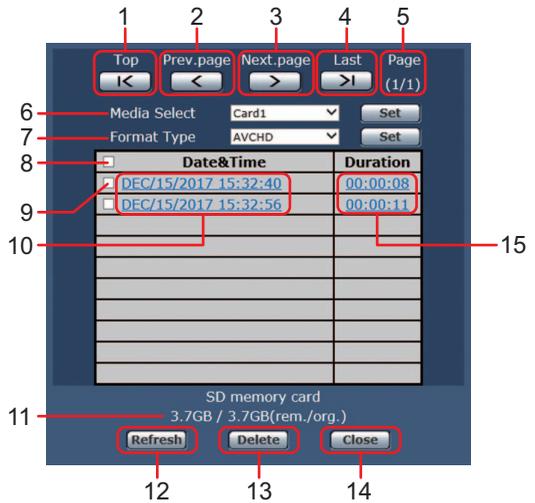
- 2 Select a card slot with [Media Select].



- Press the [Set] button to update the screen.
- 3 Select [MP4] or [AVCHD] in [Format Type].
  - Press the [Set] button to update the screen.
  - 4 Click the clip to download from the list.
    - Specify the save destination on the PC.

## ■ About the List screen

- 1 Switches to top page.
- 2 Returns to the previous page.
- 3 Goes to the next page.
- 4 Switches to last page.
- 5 Displays the number of pages.
- 6 Selects the recording media.
- 7 Selects the recording format.
- 8 Select all content.
- 9 Select content individually.
- 10 Displays the recording start date and time of the content.
- 11 Displays the remaining capacity and total capacity of the SD card.
- 12 Acquires the latest information.
- 13 Deletes the selected content.
- 14 Closes the List screen.
- 15 Displays the recording duration of the content.



- Downloaded MP4 files are designed for playback on ordinary personal computers and other devices. If playback is interrupted or the video is distorted, check “Operating environment (when network connection function is used)” (→ 124) or update the graphic driver and other software to the latest versions.
- The download operation is stopped by performing one of the following operations.
  - Switching to standby state
  - Restarting
  - Switching of priority mode (from [REC/PB] or [REC/PB(4K)] to another mode)
  - Ejecting of SD card

## Remote operation by a mobile terminal

It is possible to distribute the streaming image of this unit (IP image transfer) or change the setup of this unit (IP control) with the web screen of the mobile terminal by connecting this unit and a mobile terminal to a network via a wireless access point that is connected to this unit.

Connect to this unit from the mobile terminal and display the image of this unit (JPEG format only). The image will be automatically updated to the most current state. Operations such as zoom, focus, or white balance can also be performed from the mobile terminal.

Refer to page 124 for supported models.

- Images are displayed only in the JPEG format when using the mobile terminal.
- When the authentication dialog box is displayed, input the user name and password. The default settings for the user name and password are as follows.

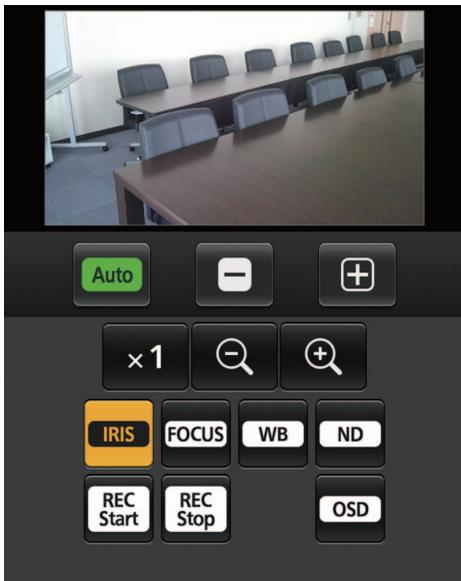
User name	admin
Password	12345

- If the mobile terminal does not support the character code UTF-8, the characters cannot be displayed properly.

### 1 Input “http://IP address/mobile/ ” using the mobile terminal, and press the enter button.

- The unit’s images will now be displayed.

#### Iris



When this button is pressed, the buttons for performing the iris operations are displayed on the screen.

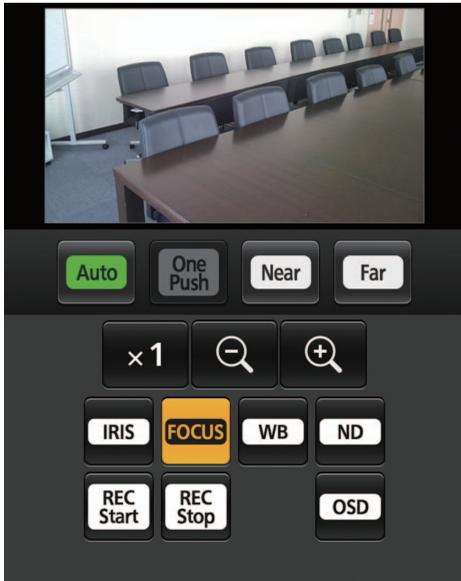
	This switches the iris between auto and manual. At the auto setting, the button label is green.
	This adjusts the iris in the “close” direction. It does not work during automatic adjustments.
	This adjusts the iris in the “open” direction. It does not work during automatic adjustments.

#### Zoom

The unit’s zooming operations are performed using these buttons.

	Use this to adjust the zoom (magnification) to 1.0x.
	Use this to adjust the zoom (magnification) in the Wide direction.
	Use this to adjust the zoom (magnification) in the Tele direction.

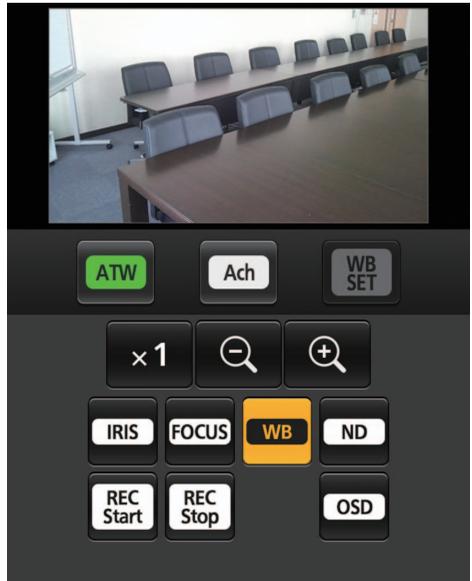
**FOCUS** Focus



When this button is pressed, the buttons for performing the focusing operations are displayed on the screen.

	<p>Use this to switch between auto and manual focusing. At the auto setting, focusing is performed (the focal point is adjusted) automatically. At the auto setting, the button label turns green.</p>
	<p>When this is pressed while the focus is being adjusted manually, the focus will be temporarily adjusted automatically. It does not work during automatic adjustments.</p>
	<p>Adjusts the focus toward "Near". It does not work during automatic adjustments.</p>
	<p>Adjusts the focus toward "Far". It does not work during automatic adjustments.</p>

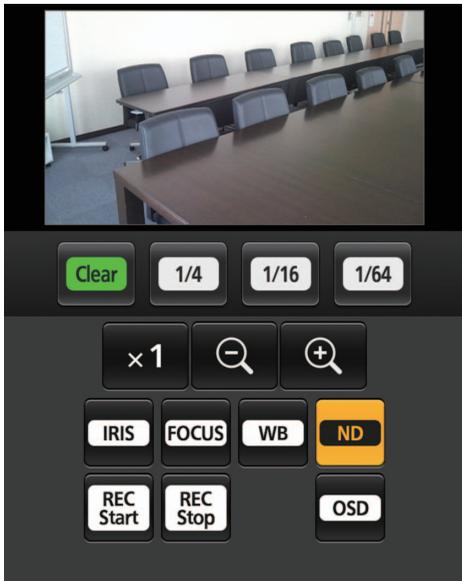
**WB** White balance



The buttons to operate the White Balance mode are displayed in the screen by pressing this button.

	<p>Switches the White Balance mode to ATW.</p>
	<p>Switches the White Balance mode to AWB A (Ach).</p>
	<p>Performs the Auto White Balance.</p>

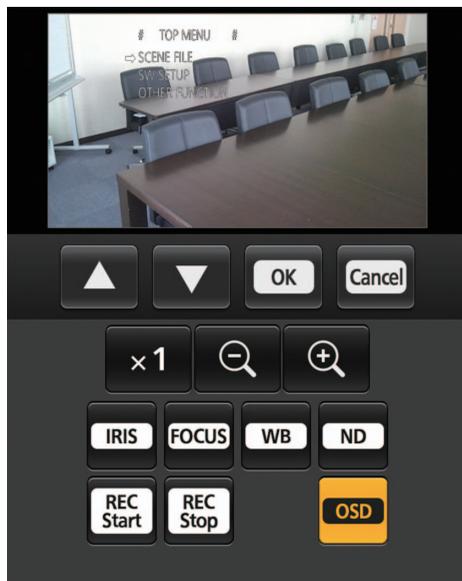
**ND** ND filter



The buttons to operate the ND Filter are displayed in the screen by pressing this button.

	ND Filter is not used.
	Reduces the light intensity to 1/4.
	Reduces the light intensity to 1/16.
	Reduces the light intensity to 1/64.

**OSD** Camera Text Menu (OSD menu) operation



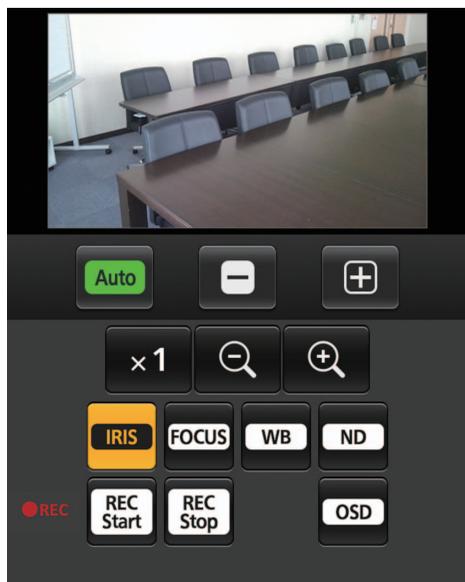
When this button is pressed, the buttons for performing the Camera Text Menu operations are displayed on the screen.

	<p>The unit's Camera Text Menu operations can be performed by pressing the , , ,  and buttons.</p> <p>When any of these buttons is pressed to switch to an operation that does not involve a Camera Text Menu, the Camera Text Menus are no longer displayed on the unit's images. For details of the Camera Text Menu, refer to page 140.</p>

- To close the Camera Text Menu, press any button other than , , or .
- The Camera Text Menu is not displayed on the IP image if [DISPLAY MENU] is set to [TOUCH]. (→ 227)
- The Camera Text Menu is displayed on the IP image as superimposed text by setting [DISPLAY MENU] to [TEXT] on the unit and then setting the Camera Text Menu display to [On] on the web screen. The Camera Text Menu is not displayed on the LCD monitor of the unit or the device connected via the SDI or HDMI output.



## Operations for recording to an SD card



Perform the operations for recording the video and audio captured with the unit to an SD card. These buttons are displayed at the bottom of the screen only when the priority mode (→ 32, 144) is set to “REC/PB” or “REC/PB(4K)”.

	Starts recording to an SD card. When this operation is performed, ●REC is displayed.
	Stops recording to an SD card. When this operation is performed, ●REC disappears.

- If the HTTP port number has been changed from “80”, enter “http://<IP address>:<port number>/mobile/” to specify the unit’s port number.
- When the authentication dialog box appears, enter the user name and password of an administrator or general user. Depending on the mobile terminal, password entry may be required when transitioning between each screen.
- Audio cannot be received on mobile terminals.
- If the [User auth.] (→ 164) setting has been changed to [On] from a personal computer while the mobile terminal screen is displayed, it may not be possible to refresh the mobile terminal screen. In a case like this, first close the web browser which is running on the mobile terminal, and then open the mobile terminal screen again.
- If, when using an Android terminal, more than one button is pressed at the same time, one of the buttons may remain pressed even after it has been released. At a time like this, press again only that button that has remained pressed to release it.

(Example) When the zoom buttons and are pressed simultaneously, even if you release them, either of them remains depressed, and as a result, zooming does not stop.

→ Press the button that remains depressed ( or button) again to stop zooming.

# Menu structure

## ■ Menu structure for Recording Mode

The menu items that can be set vary depending on the input device to be connected (CAM Mode/SDI Mode).

In CAM Mode, the Camera Text Menu can be displayed on the IP image as superimposed text. (→ 140)

\*1 The menu items below correspond to the items in "OTHER FUNCTION" of the Camera Text Menu.

○: Can be set with menu/—: Cannot be set with menu

Top menu	Menu item	Camera Text Menu	CAM Mode	SDI Mode
[SCENE FILE]	[SELECT SCENE]	○	○	—
	[NAME EDIT]	—	○	—
	[DETAIL LEVEL]	○	○	—
	[V DETAIL LEVEL]	○	○	—
	[DETAIL CORING]	○	○	—
	[SKIN TONE DTL]	○	○	—
	[WB R GAIN]	○	○	—
	[WB B GAIN]	○	○	—
	[CHROMA LEVEL]	○	○	—
	[CHROMA PHASE]	○	○	—
	[MATRIX]	○	○	—
	[COLOR CORRECTION SETTING]	○	○	—
	[MASTER PED]	○	○	—
	[GAMMA]	○	○	—
	[BLACK GAMMA]	○	○	—
	[KNEE]	○	○	—
	[DRS]	○	○	—
	[NR CONTROL]	○	○	—

Top menu	Menu item	Camera Text Menu	CAM Mode	SDI Mode
[SW SETUP]	[BACKLIGHT COMPENS.]	○	○	—
	[SPOTLIGHT COMPENS.]	○	○	—
	[ND FILTER]	○	○	—
	[IRIS MODE]	○	○	—
	[GAIN MODE]	○	○	—
	“GAIN”	○	—	—
	[AGC LIMIT]	○	○	—
	[SUPER GAIN]	○	○	—
	[SUPER GAIN EFFECT]	○	○	—
	[SHUTTER MODE]	○	○	—
	“SHUTTER SPEED”	○	—	—
	[SYNCHRO SCAN]	○	○	—
	[AUTO SLOW SHUTTER LIMIT]	○	○	—
	[AUTO SHUTTER LIMIT]	○	○	—
	[AE LEVEL]	○	○	—
	[WHITE BALANCE MODE]	○	○	—
	[VAR]	○	○	—
	[i.ZOOM]	○	○	—
	[D.ZOOM]	○	○	—
	[D.ZOOM RATIO]	○	○	—
	[O.I.S.]	○	○	—
	[HYBRID O.I.S. MODE]	○	○	—
	[CUSTOM O.I.S. SETUP]	○	○	—
	[FOCUS]	○	○	—
[CUSTOM AF STABILITY]	○	○	—	

Top menu	Menu item	Camera Text Menu	CAM Mode	SDI Mode
[SW SETUP]	[INFRARED REC]	○	○	—
	[IR REC COLOR]	○	○	—
	[SCAN REVERSE]	○	○	—
[RECORD SETUP]	[SYSTEM FREQ]	—	○	○
	[PRIORITY MODE]	—	○	○
	[REC FORMAT]	—	○	○
	[AUTO REC INPUT]	—	—	○
	[MEDIA SELECT]	—	○	○
	[PRE-REC]	—	○	○
	[TIME STAMP]	○*1	○	—
	[RECORDER ID]	○*1	○	○
[TC/UB SETUP]	[DF MODE]	—	○	○
	[TCG]	—	○	○
	[SDI REGEN]	—	—	○
	[TC PRESET]	—	○	○
	[UB PRESET]	—	○	○
[AUDIO INPUT]	[AUDIO SELECT]	○*1	○	○
	[LOWCUT]	○*1	○	○
	[AUDIO LEVEL]	○*1	○	○
	[AUDIO ALC]	○*1	○	○
	“VOLUME”	○*1	—	—
[USER SW]	[USER1]	—	○	○
	[USER2] to [USER13]	—	○	○
	[USER BUTTON DISPLAY]	—	○	○
[OUTPUT SETUP]	[SDI MODE SEL]	—	○	○
	[OUTPUT SEL]	—	○	○
	[RESOLUTION]	—	○	○
	[DOWN CONV.]	—	○	○
	[3G SDI OUTPUT]	—	—	○
	[CHAR OUTPUT]	—	○	○
	[SDI REMOTE REC]	—	○	○
	[SDI REMOTE REC LINK]	—	○	○
	[29.97p/23.98p OUTPUT]	—	○	○
	[25.00p OUTPUT]	—	○	○
	[SDI AUDIO OUTPUT GAIN]	—	○	○
	[TEST TONE]	○*1	○	○

Top menu	Menu item	Camera Text Menu	CAM Mode	SDI Mode
[CARD FUNCTION]	[FORMAT CARD]	—	○	○
	[SCENE FILE]	—	○	—
	[USER FILE]	—	○	○
	[CARD STATUS]	—	○	○
[DISP SETUP]	[COUNTER]	—	○	○
	[REC COUNTER]	—	○	○
	[FOCUS ASSIST]	—	○	—
	[PEAKING COLOR]	—	○	—
	[PEAKING LEVEL]	—	○	—
	[WFM]	—	○	○
	[WFM TYPE]	—	○	○
	[WFM POSITION]	—	○	○
	[ZEBRA]	—	○	—
	[ZEBRA MODE]	—	○	—
	[ZEBRA DETECT 1]	—	○	—
	[ZEBRA DETECT 2]	—	○	—
	[COLOR BARS]	○ <sup>*1</sup>	○	○
	[BARS TYPE]	○ <sup>*1</sup>	○	○
	[GUIDE LINES]	—	○	○
	[SAFETY ZONE]	—	○	○
	[CENTER MARKER]	—	○	○
	[DATE/TIME]	○ <sup>*1</sup>	○	○
	[DATE FORMAT]	○ <sup>*1</sup>	○	○
	[AUDIO LEVEL METER]	—	○	○
	[LENS STATUS]	—	○	—
	[CARD & BATTERY]	—	○	○
	[OTHER DISPLAY]	—	○	○
	[POWER LCD]	—	○	○
	[LCD SET]	—	○	○
	[LCD DETAIL]	—	○	○
	[LCD PEAK LEVEL]	—	○	○
[LCD PEAK FREQ.]	—	○	○	
[LCD REVERSE]	—	○	○	
[OPERATION ICONS DISPLAY]	—	○	○	

Top menu	Menu item	Camera Text Menu	CAM Mode	SDI Mode
[OTHER FUNCTION]	[CLOCK SET]	—	○	○
	[TIME ZONE]	—	○	○
	[POWER UP OPTION]	—	○	○
	[ECONOMY (BATT)]	—	—	○
	[ECONOMY (AC)]	—	—	○
	[TOUCH SCREEN]	—	○	○
	[CLIP NUMBER RESET]	—	○	○
	[DISPLAY MENU]	—	○	—
	“OSD STATUS”	○	—	—
	[INITIAL SET]	○	○	○
[LANGUAGE]	—	○	○	
[NETWORK SETUP]	[RECORDER LAN SETUP]	—	—	○
	[CAMERA LAN SETUP]	—	○	—
[MAINTENANCE]	[VERSION]	—	○	○
	[UPDATE]	—	○	○
	[HOUR METER]	—	○	○

## ■ Menu structure for Playback Mode

Top Menu	Menu item
[PLAYBACK SETUP]	[REPEAT PLAY]/[RESUME PLAY]/[PICTURE MEDIA SELECT]
[OPERATION]	[PROTECT]/[DELETE]/[COPY]
[USER SW]	[USER1]
[OUTPUT SETUP]	[OUTPUT SEL]/[RESOLUTION]/[DOWN CONV.]/[3G SDI OUTPUT]/[CHAR OUTPUT]/ [29.97p/23.98p OUTPUT]/[25.00p OUTPUT]/[SDI AUDIO OUTPUT GAIN]
[CARD FUNCTION]	[FORMAT CARD]/[CARD STATUS]
[DISP SETUP]	[COUNTER]/[DATE/TIME]/[DATE FORMAT]/[AUDIO LEVEL METER]/[CARD & BATTERY]/[OTHER DISPLAY]/[POWER LCD]/[LCD SET]/[LCD REVERSE]/ [OPERATION ICONS DISPLAY]
[OTHER FUNCTION]	[CLOCK SET]/[TIME ZONE]/[POWER UP OPTION]/[ECONOMY (BATT)]*/ [ECONOMY (AC)]*/[SYSTEM FREQ]/[TOUCH SCREEN]/[CLIP NUMBER RESET]/ [LANGUAGE]
[MAINTENANCE]	[VERSION]/[HOUR METER]

\* It is displayed after you start up the unit in SDI Mode and switch to Playback Mode.

# Using the Menu

Refer to page 34 for how to set up the Menu.

- For the items that can only be set with Camera Text Menu, refer to page 140.

## [SCENE FILE]

CAM

Settings that are assigned to [AUTO] in [SELECT SCENE] by default are indicated with underlined text.

- The setup content of the [SCENE FILE] menu is saved in the camera head.



: [SCENE FILE] → **desired setting**

## [SELECT SCENE]

It is possible to switch between Auto Mode ([AUTO]) and Manual Mode ([F1:], [F2:], [F3:]).

Your favorite image settings can be saved to the scene numbers of Manual Mode. Please switch the scene number according to the recording situation.

- For setup of Auto Mode, refer to 43.

### [AUTO]/[F1:]/[F2:]/[F3:]

#### 1 Touch [SELECT SCENE].

#### 2 Touch / to select the scene number.

- Touch [EXIT] to exit the menu screen.

#### 3 (To change the image settings)

#### Change the setting of [SCENE FILE] menu.

- You can save the settings of the following menu items to the scene number you have selected. (→ 201 to 206)

- |                    |                              |
|--------------------|------------------------------|
| – [DETAIL LEVEL]   | – [MATRIX]                   |
| – [V DETAIL LEVEL] | – [COLOR CORRECTION SETTING] |
| – [DETAIL CORING]  | – [MASTER PED]               |
| – [SKIN TONE DTL]  | – [GAMMA]                    |
| – [WB R GAIN]      | – [BLACK GAMMA]              |
| – [WB B GAIN]      | – [KNEE]                     |
| – [CHROMA LEVEL]   | – [DRS]                      |
| – [CHROMA PHASE]   | – [NR CONTROL]               |

### Default scene number settings

[AUTO]	Automatic setup
[F1:]	Setting appropriate for standard recording
[F2:]	Setup appropriate for recording focused on dynamic range
[F3:]	Picture quality setup close to digital still camera

- This function's default setting is [AUTO].
- It is possible to switch the scene number by touching , , and while displaying the operation icons. (→ 43)
- A title name can be added to the scene number [F1:]/[F2:]/[F3:] with [NAME EDIT].
- It will return to the default settings when [SCENE] is selected in [INITIAL SET]. (→ 228)

## [NAME EDIT]

---

Title of the selected scene number can be changed with [SELECT SCENE].

- Title cannot be added when set to [AUTO].

**1 Touch [NAME EDIT].**

**2 Enter the desired title.**

- For information on how to enter characters, refer to page 128.
- Up to 6 alphanumeric characters can be entered.
- Touch [Return] to return to the previous screen. (The title will not be renamed to the one that has been entered.)

**3 Touch [Enter].**

- The title will be updated.

## [DETAIL LEVEL]

---

Adjusts the degree of overall outline correction in images.

**1 Touch [DETAIL LEVEL].**

**2 Touch ◀/▶ to adjust settings.**

- You can select a value between -10 and +10.

**3 Touch [EXIT] to exit the menu screen.**

- 
- The default setting that is assigned to [AUTO] in [SELECT SCENE] is "0".

## [V DETAIL LEVEL]

---

Adjusts the degree of vertical outline correction in images.

**1 Touch [V DETAIL LEVEL].**

**2 Touch ◀/▶ to adjust settings.**

- You can select a value between -7 and +7.

**3 Touch [EXIT] to exit the menu screen.**

- 
- The default setting that is assigned to [AUTO] in [SELECT SCENE] is "0".

## [DETAIL CORING]

---

Adjusts the detail noise removal level.

**1 Touch [DETAIL CORING].**

**2 Touch ◀/▶ to adjust settings.**

- You can select a value between 0 and 20.

**3 Touch [EXIT] to exit the menu screen.**

- 
- The default setting that is assigned to [AUTO] in [SELECT SCENE] is "0".

## [SKIN TONE DTL]

This makes skin colors appear softer for a more attractive appearance. This is more effective if you record a person closely from the torso up.

- 1 Touch **[SKIN TONE DTL]**.
- 2 Touch **▲ / ▼** to select the setting item.

<b>[OFF]:</b>	[SKIN TONE DTL] is not used
<b>[LOW]:</b>	Lower setup
<b>[HIGH]:</b>	Higher setup

- 3 Touch **[EXIT]** to exit the menu screen.

- If the background or anything else in the scene has colors similar to the skin color, they will also be smoothed.
- If the brightness is insufficient, the effect may not be clear.
- If you record a person in the distance, the face may not be recorded clearly. In this case, set [SKIN TONE DTL] to [OFF] or zoom in on the face (close-up) to record.

## [WB R GAIN]

Adjusts the intensity of red when the White Balance Mode is set to [AWB A] (Ach), [AWB B] (Bch), or [VAR].

- Set **[WHITE BALANCE MODE]** to [AWB A], [AWB B], or [VAR] (→ 52)

- 1 Touch **[WB R GAIN]**.
- 2 Touch **◀ / ▶** to adjust the color balance.

- You can select a value between -30 and +30.
- Touch [RETURN].

- 3 Touch **[EXIT]** to exit the menu screen.

- The default setting that is assigned to [AUTO] in [SELECT SCENE] is "0".
- When the Auto White Balance/Auto Black Balance is performed, the setup for [WB R GAIN] and [WB B GAIN] will be set to 0. (→ 53)

## [WB B GAIN]

Adjusts the intensity of blue when the White Balance Mode is set to [AWB A] (Ach), [AWB B] (Bch), or [VAR].

- Set **[WHITE BALANCE MODE]** to [AWB A], [AWB B], or [VAR] (→ 52)

- 1 Touch **[WB B GAIN]**.
- 2 Touch **◀ / ▶** to adjust the color balance.

- You can select a value between -30 and +30.
- Touch [RETURN].

- 3 Touch **[EXIT]** to exit the menu screen.

- The default setting that is assigned to [AUTO] in [SELECT SCENE] is "0".
- When the Auto White Balance/Auto Black Balance is performed, the setup for [WB R GAIN] and [WB B GAIN] will be set to 0. (→ 53)

## [CHROMA LEVEL]

---

Adjusts color density.

- 1 Touch **[CHROMA LEVEL]**.
- 2 Touch  /  to adjust settings.
- 3 Touch **[EXIT]** to exit the menu screen.

- 
- The default setting that is assigned to [AUTO] in [SELECT SCENE] is "0".

## [CHROMA PHASE]

---

Adjusts color balance.

- 1 Touch **[CHROMA PHASE]**.
- 2 Touch  /  to adjust settings.
- 3 Touch **[EXIT]** to exit the menu screen.

- 
- The default setting that is assigned to [AUTO] in [SELECT SCENE] is "0".

## [MATRIX]

---

Represents the color during the recording.

- 1 Touch **[MATRIX]**.
- 2 Touch  /  to select the setting item.

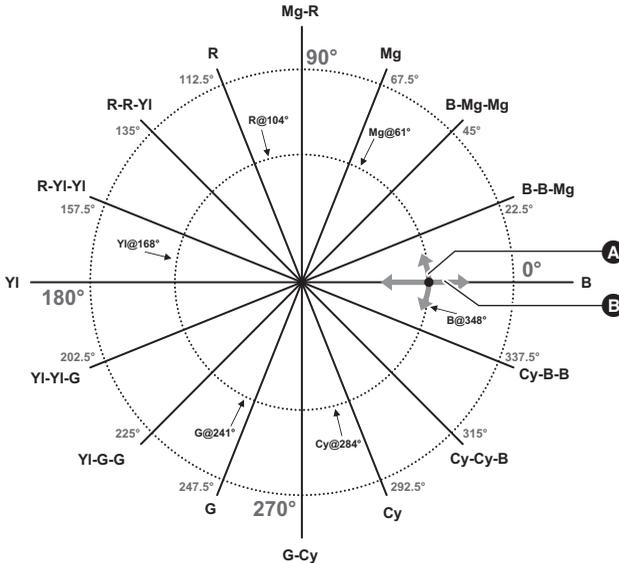
<b>[NORM]:</b>	Suitable for recording in the open air or under a halogen lamp.
<b>[CINE-LIKE]:</b>	Suitable for cinema-like image.
<b>[STILL-LIKE]:</b>	Expresses colors in a picture tone similar to that produced with a digital still camera.

- 3 Touch **[EXIT]** to exit the menu screen.

## [COLOR CORRECTION SETTING]

This function sets color saturation and phase. It applies individual effect on 16 phases in an image. It can be set to individual color hue.

- The values of the angles below are approximate.



- 1 Touch [COLOR CORRECTION SETTING].
- 2 Touch the phase you want to set.

[B]/[B-B-Mg]/[B-Mg-Mg]/[Mg]/[Mg-R]/[R]/[R-R-YI]/[R-YI-YI]/[YI]/[YI-YI-G]/[YI-G-G]/[G]/[G-Cy]/[Cy]/[Cy-Cy-B]/[Cy-B-B]

- Next (Previous) page can be displayed by touching ▲ / ▼.

- 3 (To adjust the saturation)

Touch [SAT].

(To adjust the phase)

Touch [PHASE].

- 4 Touch ◀ / ▶ to adjust settings.

- Values that fall in the following ranges can be set.

- SAT: -31 to +31
- PHASE: -63 to +63

- (If you have touched [PHASE])

Making adjustments in the + direction corresponds to making adjustments clockwise in the diagram above.

Conversely, making adjustments in the - direction corresponds to making adjustments counterclockwise in the diagram.

- 5 Touch [RETURN].

- Touch [EXIT] to exit the menu screen.

- By default the following values are set for [AUTO] in [SELECT SCENE]

- SAT: "0"
- PHASE: "0"

## [MASTER PED]

Adjustment of black level based on the image is performed.

- 1 Touch **[MASTER PED]**.
- 2 Touch  /  to adjust the black level.
- 3 Touch **[EXIT]** to exit the menu screen.

- The default setting that is assigned to [AUTO] in [SELECT SCENE] is "0".

## [GAMMA]

Tone or contrast of the image is set in accordance with the recorded scenes.

- 1 Touch **[GAMMA]**.
- 2 Touch  /  to select the setting item.

**[HD NORM]:** This is the video gamma feature for HD (High Definition).

**[CINE-LIKE D]:** This gamma feature creates cinematic images.

**[STILL-LIKE]:** Expresses colors in a picture tone similar to that produced with a digital still camera.

- 3 Touch **[EXIT]** to exit the menu screen.

- When [CINE-LIKE D] is selected, we recommend that you set the lens aperture to a level lower than the normal lens iris level (approximately 1/2) to fully utilize the feature of the selected setting.

## [BLACK GAMMA]

This sets the gamma curve of dark areas.

- 1 Touch **[BLACK GAMMA]**.
- 2 Touch  /  to adjust settings.

- You can select a value between -7 and +7.
- Making adjustments in the - direction compresses dark areas, while making adjustments in the + direction expands them.

- 3 Touch **[EXIT]** to complete the setting.

- The default setting that is assigned to [AUTO] in [SELECT SCENE] is "0".

## [KNEE]

To avoid overexposure, select the compression level of the high intensity video signals received through the image sensor.

- 1 Touch **[KNEE]**.
- 2 Touch  /  to select the setting item.

**[AUTO]:** Sets the level automatically according to the signals received.

**[LOW]:** Lower setup (start compression from approximately 80%)

**[MID]:** Medium setup (start compression from approximately 90%)

**[HIGH]:** Higher setup (start compression from approximately 100%)

- 3 Touch **[EXIT]** to exit the menu screen.

- This item can be set when [GAMMA] is set to [HD NORM].

## [DRS]

---

Selects the DRS (Dynamic Range Stretcher) function.

The dynamic range can be expanded by compressing the level of the video signals in high-brightness areas where overexposure occurs during normal recording.

- 1 Touch **[DRS]**.
- 2 Touch  /  to change the setting.

## [OFF]/[LOW]/[MID]/[HIGH]

- The compression level of the high brightness becomes larger and noise in the dark becomes larger going toward [HIGH].
- 3 Touch **[EXIT]** to exit the menu screen.

- 
- If there are extremely dark or bright parts or the brightness is not sufficient, the effect may not be clear.

## [NR CONTROL]

---

You can control the noise reduction effect and afterimage intensity by adjusting the noise reduction setting.

- 1 Touch **[NR CONTROL]**.
- 2 Touch  /  to adjust settings.
  - You can select a value between  $-7$  and  $+7$ .
  - Adjusting the setting in the minus ( $-$ ) direction weakens the noise reduction effect, thereby reducing afterimages. Note that this also tends to increase noise.
  - Adjusting the setting in the plus ( $+$ ) direction enhances the noise reduction effect, thereby reducing noise. Note that this may also cause afterimages to appear more frequently.
- 3 Touch **[EXIT]** to exit the menu screen.

- 
- The default setting that is assigned to [AUTO] in [SELECT SCENE] is "0".

# [SW SETUP]

CAM

All default settings are indicated with underlined text.

 : [SW SETUP] → **desired setting**

## [BACKLIGHT COMPENS.]

Switches to auto control for backlight compensation. (→ 55)

The image of the screen can be brightened so the backlit subject does not get dark due to light hitting from rear.

[ON]/[OFF]

## [SPOTLIGHT COMPENS.]

Switches to auto control for spotlight. (→ 55)

Excessively bright subject can be recorded beautifully.

[ON]/[OFF]

## [ND FILTER]

The built-in optical ND filter (light intensity adjustment filter) can be switched. (→ 80)

[CLEAR]/[1/4]/[1/16]/[1/64]

## [IRIS MODE]

Switches the Auto/Manual of the iris adjustment. (→ 54)

[AUTO]/[MANUAL]

## [GAIN MODE]

Switches the Auto/Manual of the gain adjustment. (→ 56)

[AUTO]/[MANUAL]

## [AGC LIMIT]

Sets the maximum possible gain value for Auto Gain Mode. (→ 57)

[3 dB]/[6 dB]/[9 dB]/[12 dB]/[15 dB]/[18 dB]/[21 dB]/[24 dB]/[27 dB]/[30 dB]

## [SUPER GAIN]

Changes the gain value to the setup of [SUPER GAIN]. (→ 57)

[ON]/[OFF]

## [SUPER GAIN EFFECT]

Sets the gain value during Super Gain. (→ 57)

[33 dB]/[36 dB]

## [SHUTTER MODE]

Switches the Auto/Manual of the shutter speed adjustment. (→ 58)

[AUTO]/[MANUAL]

## [SYNCHRO SCAN]

Sets the initial Synchro Scan setting.

- Depending on the size and frame rate in [REC FORMAT], the setting range varies. (→ 212)

- 1 Touch [SYNCHRO SCAN].
- 2 Touch  /  to adjust settings.
- 3 Touch [EXIT] to complete the setting.

### ■ Note on the [SYNCHRO SCAN] setting

A separate [SYNCHRO SCAN] setting is maintained for each size and frame rate in [REC FORMAT].

- Default settings are indicated with underlined text.

Frame rates	[SYNCHRO SCAN] setting
59.94p/59.94i	<u>1/60.0</u> to 1/285.6
29.97p	1/30.0 to <u>1/60.0</u> to 1/206.5
23.98p	1/24.0 to <u>1/48.0</u> to 1/280.1
50.00p/50.00i	<u>1/50.0</u> to 1/209.2
25.00p	1/25.0 to <u>1/50.0</u> to 1/224.3

## [AUTO SLOW SHUTTER LIMIT]

Sets the lower limit value of the shutter speed during the Auto Shutter Mode.

The items that can be set up vary depending on the frame rate of the recording format.

Frame rates in [REC FORMAT]	Items that can be set up
59.94p/59.94i/29.97p	[1/8]/[1/15]/[1/30]/[ <u>1/60</u> ]
50.00p/50.00i/25.00p	[1/6]/[1/12]/[1/25]/[ <u>1/50</u> ]
23.98p	[1/6]/[1/12]/[1/24]/[ <u>1/48</u> ]

- The screen may look like time-lapse or residual image may appear when the shutter speed is slower than 1/30.

## [AUTO SHUTTER LIMIT]

Sets the upper limit value of the shutter speed during the Auto Shutter Mode.

[OFF]/[1/100]/[1/120]<sup>\*1</sup>/[1/125]<sup>\*2</sup>/[1/250]

\*1 Not displayed when [SYSTEM FREQ] is set to [50.00Hz].

\*2 Not displayed when [SYSTEM FREQ] is set to [59.94Hz].

## [AE LEVEL]

Adjusts the brightness during Auto Mode or when one of [IRIS MODE], [GAIN MODE], or [SHUTTER MODE] is set to [AUTO]. (→ 55)

**1 Touch [AE LEVEL].**

**2 Touch  /  to adjust settings.**

• You can select a value between -10 and +10.

**3 Touch [EXIT] to exit the menu screen.**

• The initial setup is 0.

## [WHITE BALANCE MODE]

Switches the White Balance Mode. (→ 52)

[ATW]/[AWB A]/[AWB B]/[P3200K]/[P5600K]/[VAR]

## [VAR]

Sets the color temperature when the White Balance mode is set to [VAR]. (→ 53)

**1 Touch [VAR].**

**2 Touch  /  to adjust settings.**

• You can select a value between 2000K and 15000K.

**3 Touch [EXIT] to exit the menu screen.**

• This function's default setting is "3200K".

## [i.ZOOM]

You can zoom in while maintaining the beauty of high-definition picture quality up to a magnification of 30×. (→ 46)

• The zoom magnification when [i.ZOOM] is set depends on the setup of [PRIORITY MODE].

– When [IP] or [REC/PB] is set: Approx. 30×

– When [IP(4K)] or [REC/PB(4K)] is set: Approx. 22×

[ON]/[OFF]

## [D.ZOOM]

Switches the on/off of the digital zoom. (→ 68)

[ON]/[OFF]

## [D.ZOOM RATIO]

Changes the zoom magnification setting of Digital Zoom. (→ 68)

[× 1.4] (1.4×)/[× 2] (2×)/[× 4] (4×)/[× 6] (6×)/[× 8] (8×)

## **[O.I.S.]**

Switches the on/off of the image stabilization. (→ 47)

**[ON]/[OFF]**

## **[HYBRID O.I.S. MODE]**

Hybrid image stabilization (hybrid O.I.S.) can be set up. (→ 47)

**[ON]/[OFF]**

## **[CUSTOM O.I.S. SETUP]**

The image stabilization effect can be switched depending on the recording style. (→ 47)

**[NORMAL]/[STATIONARY]**

## **[FOCUS]**

Switches the Auto/Manual of the focus adjustment. (→ 48)

**[AUTO]/[MANUAL]**

## **[CUSTOM AF STABILITY]**

How easily focusing starts during Auto Focus can be adjusted. (→ 49)

**[1]/[2]/[3]**

## **[INFRARED REC]**

Selecting [ON] enables Infrared Recording Mode, allowing you to record images in the dark. (→ 69)

**[ON]/[OFF]**

## **[IR REC COLOR]**

This changes the color in which images are recorded in Infrared Recording Mode.

**[Green]/[White]**

## **[SCAN REVERSE]**

The recorded image can be reversed vertically and horizontally. Lch/Rch of the built-in microphone will also switch. (→ 38)

**[ON]/[OFF]**

## [RECORD SETUP]

---

All default settings are indicated with underlined text.



: [RECORD SETUP] → **desired setting**

### [SYSTEM FREQ]

CAM

SDI

Set the system frequency of this unit. (→ 40)

[59.94Hz]/[50.00Hz]

- After you have changed the system frequency, this unit will be restarted automatically.
- AG-UMR20P: This function's default setting is [59.94Hz].  
AG-UMR20E: This function's default setting is [50.00Hz].

### [PRIORITY MODE]

CAM

SDI

By switching [PRIORITY MODE], this unit can operate according to various applications. (→ 32)

[IP]/[REC/PB]/[IP(4K)]/[REC/PB(4K)]

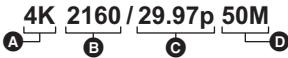
Switch the picture quality of motion pictures to be recorded with this unit.

Depending on the settings of [SYSTEM FREQ] (→ 40) and [PRIORITY MODE], the available [REC FORMAT] settings differ.

- [REC FORMAT] cannot be set when [PRIORITY MODE] is set to [IP] or [IP(4K)].

### How to read a [REC FORMAT] setting

Items that make up a [REC FORMAT] setting represent Size, Vertical resolution, Frame rate, and Bit rate. (Excluding the [REC FORMAT] settings that are available when [PRIORITY MODE] is set to [REC/PB])



- A** Size
- B** Vertical resolution
- C** Frame rate
- D** Bit rate

- Smoother motion picture can be recorded with the higher value for the frame rate. [i] and [p] of the frame rate means interlace and progressive respectively.

#### Interlace (interlacing scanning)

Video signal that divides the effective scanning lines to half and send them alternatively

#### Progressive (progressive scanning)

High density video signal sending the effective scanning lines simultaneously (It will be higher quality image than the interlace.)

- Depending on the [PRIORITY MODE] setting and the [REC FORMAT] setting, its required Speed Class of the SD card differs. Use an SD card that meets the settings. For details, refer to "About the Speed Class ratings for recording motion pictures" on page 27.

## ■ Items that can be set up during CAM Mode

- When [PRIORITY MODE] is set to [REC/PB(4K)]

Recording format	System frequency setting	Size (Picture size)	Frame rate	Bit rate (VBR)
4K 2160/ 29.97p 50M	59.94Hz	4K (3840×2160)	29.97p	Average 50 Mbps
4K 2160/ 23.98p 50M			23.98p	
4K 2160/ 25.00p 50M	50.00Hz		25.00p	

- When [PRIORITY MODE] is set to [REC/PB]

Recording format	System frequency setting	Picture size	Frame rate	Bit rate (VBR)
PS 1080/59.94p	59.94Hz	1920×1080	59.94p	Average 25 Mbps
PH 1080/59.94i			59.94i	Average 21 Mbps
PH 1080/23.98p			23.98p	
PH 720/59.94p		1280×720	59.94p	Average 17 Mbps
HA 1080/59.94i		1920×1080	59.94i	
HE 1080/59.94i		1440×1080		Average 5 Mbps
PM 720/59.94p	1280×720		59.94p	Average 8 Mbps

Recording format	System frequency setting	Picture size	Frame rate	Bit rate (VBR)
PS 1080/50.00p	50.00Hz	1920×1080	50.00p	Average 25 Mbps
PH 1080/50.00i			50.00i	
PH 720/50.00p		1280×720	50.00p	Average 21 Mbps
HA 1080/50.00i		1920×1080	50.00i	
HE 1080/50.00i		1440×1080		Average 5 Mbps
PM 720/50.00p		1280×720	50.00p	Average 8 Mbps

## ■ Items that can be set up during SDI Mode

- For the signal format of the SDI input, refer to page 95.
- When [PRIORITY MODE] is set to [REC/PB]

Recording format	System frequency setting	Picture size	Frame rate	Bit rate (VBR)	
PS 1080/59.94p	59.94Hz	1920×1080	59.94p	Average 25 Mbps	
PH 1080/59.94i			59.94i		
PH 1080/23.98p			23.98p		
PH 720/59.94p		1280×720	59.94p	Average 21 Mbps	
HA 1080/59.94i		1920×1080	59.94i		Average 17 Mbps
HE 1080/59.94i		1440×1080		Average 5 Mbps	
PM 720/59.94p		1280×720	59.94p	Average 8 Mbps	
PH 1080/59.94i FROM 720p		1920×1080	1920×1080	59.94i	Average 21 Mbps
HA 1080/59.94i FROM 720p					Average 17 Mbps
HE 1080/59.94i FROM 720p					Average 5 Mbps
PS 1080/50.00p		50.00Hz	1920×1080	50.00p	Average 25 Mbps
PH 1080/50.00i	50.00i				
PH 720/50.00p	1280×720		50.00p	Average 21 Mbps	
HA 1080/50.00i	1920×1080		50.00i		Average 17 Mbps
HE 1080/50.00i	1440×1080			Average 5 Mbps	
PM 720/50.00p	1280×720		50.00p	Average 8 Mbps	
PH 1080/50.00i FROM 720p	1920×1080		1920×1080	50.00i	Average 21 Mbps
HA 1080/50.00i FROM 720p					Average 17 Mbps
HE 1080/50.00i FROM 720p					Average 5 Mbps

### • Recordable time using the battery (→ 26)

- When the default setting for [SYSTEM FREQ] is [59.94Hz]:  
The default setting for [PRIORITY MODE] is [REC/PB], and the default setting for [REC FORMAT] is [PH 1080/59.94i].  
When the default setting for [SYSTEM FREQ] is [50.00Hz]:  
The default setting for [PRIORITY MODE] is [REC/PB], and the default setting for [REC FORMAT] is [PH 1080/50.00i].
- Please refer to page 254 about approximate recordable time.
- When the Camera Head or Camera Recorder connected to the unit is moved a lot or moved quickly, or when a fast-moving subject is recorded, mosaic-type noise may appear during playback. (Only when recording AVCHD clips)

## [AUTO REC INPUT]

[SDI]

This unit can start/stop recording automatically following the AUTO REC signal input from the camera recorder connected to the SDI IN terminal. (→ 81)

[OFF]/[TYPE1]/[TYPE2]/[TYPE3]

## [MEDIA SELECT]

[CAM]

[SDI]

Card slot can be selected separately to record motion pictures. (→ 40)

[SD CARD 1]/[SD CARD 2]

## [PRE-REC]

[CAM]

[SDI]

Image and audio before pressing the REC/PAUSE button is recorded. AVCHD clips will record from approximately 3 seconds before, and MP4 clips will record from approximately 4 seconds before. (→ 70)

[ON]/[OFF]

## [TIME STAMP]

[CAM]

You can stamp the date and time of recording on the images you record.

[ON]/[OFF]

- **R** appears on the screen.
- The format of the recording date and time varies depending on the settings of [DATE/TIME] and [DATE FORMAT]. (→ 224)
- The month of the date and time of recording is recorded in English.
- In the following cases, even when [TIME STAMP] is set to [ON], the time stamp function cannot be enabled.
  - When [DATE/TIME] is set to [OFF]
  - During Freeze Frame (→ 69)
- The date and time of recording displayed during [TIME STAMP] recording and the date and time displayed during the playback of the image may not exactly be the same.

## [RECORDER ID]

[CAM]

[SDI]

This sets the recorder ID for this unit.

- 1 Touch [RECORDER ID].
  - 2 Touch  /  to change the Camera Number.
- Numbers between 0 and 16 can be set.
- 3 Touch [RETURN].
- Touch [EXIT] to exit the menu screen.
- 
- This function's default setting is "0".

## [TC/UB SETUP]

---

All default settings are indicated with underlined text.

 : [TC/UB SETUP] → desired setting

### [DF MODE]

CAM

SDI

Selects the compensation mode for the time code. (→ 63)

- Set [SYSTEM FREQ] to [59.94Hz]. (→ 40)

### [DF]/[NDF]

### [TCG]

CAM

SDI

Sets the way the time code will move. (→ 63)

### [FREE RUN]/[REC RUN]

### [SDI REGEN]

SDI

The values of the time code and the users bit to be recorded in the SDI Mode can be selected. (→ 65)

### [ON]/[OFF]

### [TC PRESET]

CAM

SDI

Initial value of the time code can be set. (→ 63)

### [UB PRESET]

CAM

SDI

- Set [PRIORITY MODE] to [REC/PB] or [IP] (→ 32)

User Information can be set. (→ 64)

# [AUDIO INPUT]

**CAM** **SDI**

All default settings are indicated with underlined text.

 : **[AUDIO INPUT]** → desired setting

## [AUDIO SELECT]

Switches the audio input. (→ 60)

(During CAM Mode)

[INTERNAL MIC]/[OFF]

(During SDI Mode)

[OFF]/[SDI]/[LINE]/[MIC]/[Plug-in Power Mic]

## [LOWCUT]

Reduces the level of the bass.

[ON]/[OFF]

- You may not see the full effect depending on the recording conditions.
- [LOWCUT] setup cannot be changed when [AUDIO SELECT] is set to [OFF] or [SDI].

## [AUDIO LEVEL]

Switches the adjustment method of Audio Level. (→ 61)

[AUTO]/[MANUAL]

## [AUDIO ALC]

Distortion of sound can be decreased by setting to [ON]. Natural-sounding audio will be recorded when [OFF] is set. (→ 61)

- Set [AUDIO LEVEL] to [MANUAL].(→ 61)

[ON]/[OFF]

## [USER SW]

The menu items to be displayed vary depending on whether the unit is in Recording Mode or Playback Mode. All default settings are indicated with underlined text.



### [USER1]

CAM

SDI



Sets the function to assign to the USER buttons. (→ 65)

- For the functions of the USER button that can be registered, refer to page 67.
- The default settings are as follows:
  - USER1: <REC CHECK>

### [USER2]/[USER3]/[USER4]/[USER5]/[USER6]/[USER7]/ [USER8]/[USER9]/[USER10]/[USER11]/[USER12]/[USER13]

CAM

SDI

Register functions to USER button icons. (→ 65)

- For the functions of the USER button that can be registered, refer to page 67.
- The default settings are as follows:
  - USER2: <DISP/MODE CHK>
  - USER3: <FRZ FRAME>
  - USER4: <BACKLIGHT>
  - USER5: <MENU>
  - USER6 to USER13: <INHIBIT>

### [USER BUTTON DISPLAY]

CAM

SDI

Switches the display of the set USER button icons. (→ 66)

[ON]/[OFF]

## [OUTPUT SETUP]

Different menu items are displayed depending on whether this unit is in Recording Mode or Playback Mode. All default settings are indicated with underlined text.

 : [OUTPUT SETUP] → desired setting

### [SDI MODE SEL]

**CAM** **SDI**

Switches the output method of the SDI OUT terminal. (→ 94)

[NORMAL]/[THROUGH]

### [OUTPUT SEL]

**CAM** **SDI** ▶

This changes the way in which images are output to an external device. (→ 96)

[SDI+HDMI]/[SDI]/[HDMI]

### [RESOLUTION]

**CAM** **SDI** ▶

Switches the image format of the external output. (→ 96)

(In Recording Mode)

[1080p]/[1080i]/[720p]/[DOWN CONV.]

(In Playback Mode)

[SYSTEM]/[1080p]/[1080i]/[DOWN CONV.]

### [DOWN CONV.]

**CAM** **SDI** ▶

This function allows you to select how to display images with a 16:9 aspect ratio on an external monitor with a 4:3 aspect ratio. (→ 93)

- Set [RESOLUTION] to [DOWN CONV.].

[SIDE CROP]/[LETTERBOX]/[SQUEEZE]

### [3G SDI OUTPUT]

**SDI** ▶

Selects the 1080p signal for the HD SDI output during 1080p Mode.

[LEVEL-A]: Selects LEVEL–A format.

[LEVEL-B]: Selects LEVEL–B DL format.

- Setup cannot be changed when [SDI MODE SEL] is set to [THROUGH].

## [CHAR OUTPUT]

CAM

SDI



Selects whether or not to superimpose characters on the output image from the HDMI OUT terminal or the SDI OUT terminal.

**[ON]:** Superimposes characters.

**[OFF]:** Does not superimpose characters.

- Characters are not displayed on the output image from the SDI OUT terminal when [SDI MODE SEL] is set to [THROUGH].
- Characters are not displayed on the output image from the HDMI OUT terminal or the SDI OUT terminal when [WFM] is set to [ON].

## [SDI REMOTE REC]

CAM

SDI

This enables/disables a function that controls recording performed with an external device connected to the unit. (→ 81)

**[TYPE3]/[OFF]**

## [SDI REMOTE REC LINK]

CAM

SDI

When [ON] is selected, you can control recording performed with this unit and an external device using the recording REC/PAUSE button. (→ 82)

**[ON]/[OFF]**

## [29.97p/23.98p OUTPUT]

CAM

SDI



Allows you to set the external output format of the SDI OUT terminal to be used when the frame rate of the recording format is 29.97p or 23.98p. It is possible to select PsF or a setting that converts the output frame rate to 59.94i.

- Set [SYSTEM FREQ] to [59.94Hz]

**[PsF]:** Outputs in 1080/29.97PsF or 1080/23.98PsF.

**[over 59.94i]:** Converts and outputs in 1080/59.94i.

- When [OUTPUT SEL] is set to a setting other than [SDI], the [29.97p/23.98p OUTPUT] setting can be changed, but the changed setting cannot be used.

## [25.00p OUTPUT]

CAM

SDI



Allows you to set the external output format of the SDI OUT terminal to be used when the frame rate of the recording format is 25.00p. It is possible to select PsF or a setting that converts the output frame rate to 50.00i.

- Set [SYSTEM FREQ] to [50.00Hz]

**[PsF]:** Outputs in 1080/25.00PsF.

**[over 50.00i]:** Converts and outputs in 1080/50.00i.

- When [OUTPUT SEL] is set to a setting other than [SDI], the [25.00p OUTPUT] setting can be changed, but the changed setting cannot be used.

## [SDI AUDIO OUTPUT GAIN]

CAM

SDI



Adjusts the gain value of the audio output signal of the SDI OUT terminal.

- Set [OUTPUT SEL] to [SDI] (→ 96)
- (In case of Playback Mode)  
Touch the Play Mode selection icon, and set to Clip Playback Mode (→ 83)

[0 dB] / [-6 dB] / [-12 dB]

- Setup cannot be changed when [SDI MODE SEL] is set to [THROUGH]

## [TEST TONE]

CAM

SDI

Selects the test tone output when color bars are displayed. (→ 73)

<u>[OFF]</u> :	Does not output a test tone.
[LEVEL 1]:	Outputs a high volume test tone.
[LEVEL 2]:	Outputs a low volume test tone.

## [CARD FUNCTION]

Different menu items are displayed depending on whether this unit is in Recording Mode or Playback Mode.  
All default settings are indicated with underlined text.

 MENU : [CARD FUNCTION] → **desired setting**

## [FORMAT CARD]

CAM

SDI



The SD card can be formatted. (→ 40)

- Please be aware that if a medium is formatted, then all the data recorded on the medium will be erased and cannot be restored. Back up important data on a PC etc. (→ 106)

## [SCENE FILE]

CAM

You can save the scene file settings to the SD card or load them from the SD card to this unit. (→ 70)

[LOAD]/[SAVE]

## [USER FILE]

CAM

SDI

The menu setups other than [SCENE FILE] or [NETWORK SETUP] can be saved to a SD card, or loaded to this unit from a SD card.

- Setup for [SYSTEM FREQ], [CLOCK SET], [TIME ZONE], and [LANGUAGE] are not saved.
- User files saved in a different Operation Mode (CAM Mode/SDI Mode) cannot be loaded.

### ■ To save user file

1 Touch [USER FILE].

2 Touch [SAVE].

3 Touch user file name.

- Maximum of 8 files can be saved.
- Touch [YES] to overwrite if a user file that is already saved is touched.

4 Touch [EXIT] to complete the setup.

### ■ To read the saved user file

1 Touch [USER FILE].

2 Touch [LOAD].

3 Touch user file name to read.

- This unit is rebooted and the menu setup is reflected by touching [YES].

## [CARD STATUS]

CAM

SDI



The used space and remaining recordable time of the SD card can be checked.

- Touching [CHANGE CARD] switches the unit between the display for the SD card 1 and the display for the SD card 2.
- Only in Recording Mode, remaining recordable time for the selected recording format is displayed.
- Touch [EXIT] to close the indication.

- The SD card requires some space to store information and manage system files, so the actual usable space is slightly less than the indicated value. The usable space is generally calculated as 1 GB=1,000,000,000 bytes. The capacities of this unit, PCs and software are expressed as 1 GB=1,024×1,024×1,024=1,073,741,824 bytes. Therefore, the indicated value of the capacity appears to be smaller.

## [DISP SETUP]

Different menu items are displayed depending on whether this unit is in Recording Mode or Playback Mode. All default settings are indicated with underlined text.



: [DISP SETUP] → **desired setting**

## [COUNTER]

CAM

SDI



Switches the counter display. (→ 62)

[TC]/[UB]/[REC COUNTER]/[OFF]

## [REC COUNTER]

CAM

SDI

Selects the operation of the Recording Counter during recording. (→ 64)

[TOTAL]/[CLIP]

## [FOCUS ASSIST]

CAM

Switches on/off Focus Assist. (→ 51)

[ON]/[OFF]

## [PEAKING COLOR]

CAM

You can set the peaking color for Focus Assist. (→ 51)

[Red]/[Blue]/[Yellow]/[White]

## [PEAKING LEVEL]

CAM

You can set the peaking strength for Focus Assist. (→ 51)

- This function's default setting is "0".

## [WFM]

CAM

SDI

This enables/disables the Wave Form Monitor function. (→ 77)

[ON]/[OFF]

## [WFM TYPE]

CAM

SDI

This sets the type of Wave Form Monitor. (→ 77)

[WAVE]/[VECTOR]/[WAVE/VECTOR]

## [WFM POSITION]

CAM

SDI

This sets the display positions of Wave Form Monitor. (→ 77)

[TOP/LEFT]/[TOP/RIGHT]/[BOTTOM/LEFT]/[BOTTOM/RIGHT]

## [ZEBRA]

CAM

Switch between the zebra display and marker display.

[ZEBRA 1]/[ZEBRA 2]<sup>\*</sup>/[OFF]

\* This cannot be set if [ZEBRA DETECT 2] is set to [OFF]. (→ 223)

- For information on the zebra display, refer to page 72.

## [ZEBRA MODE]

CAM

This sets the display duration of the zebra display.

[CONTINUE]: Displays the zebra display until it is switched to another zebra display setting.

[MOMENT]: Displays the zebra display for approximately 5 seconds.

## [ZEBRA DETECT 1]

CAM

Selects the brightness level of the left-leaning zebra patterns on the screen.

### 1 Touch [ZEBRA DETECT 1].

- Touch [YES].

### 2 Touch / to adjust settings.

- You can select a value between 50% and 105%.

### 3 Touch [EXIT] to complete the setting.

- This function's default setting is "80%".

## [ZEBRA DETECT 2]

CAM

Selects the brightness level of the right-leaning zebra patterns on the screen.

[SET]/[OFF]

### 1 Touch [ZEBRA DETECT 2].

- Touch [SET].

### 2 Touch / to adjust settings.

- You can select a value between 50% and 105%.

### 3 Touch [EXIT] to complete the setting.

- You can display [ZEBRA 2] after setting the level. (→ 72)

- This function's default setting is "100%".

## [COLOR BARS]

CAM

SDI

The color bar convenient for picture quality adjustment of the external monitor can be displayed. (→ 73)

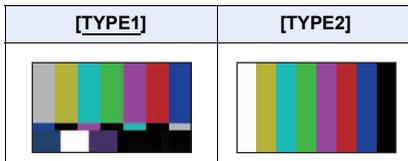
[ON]/[OFF]

## [BARS TYPE]

CAM

SDI

Type of the color bar can be switched. (→ 73)



## [GUIDE LINES]

CAM

SDI

You can check if the image is level while recording motion pictures and still pictures. The function can also be used to estimate the balance of the composition.

[OFF]/[HORIZONTAL]/[GRID1]/[GRID2]

- The guidelines do not appear on the images actually recorded.

- The setting changes as follows when using Focus Assist. (→ 51)

- The guidelines are not displayed. (They are displayed on the external monitor when this unit is connected to the external monitor.)
- The setting cannot be changed.

## [SAFETY ZONE]

CAM

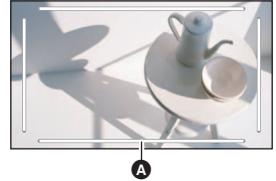
SDI

Display of the range that can be displayed with the external monitor (safety zone **A**) can be switched.

(When [16:9 90%] is set)

[OFF]/[16:9 90%]/[4:3]/[14:9]/[1.85:1]/[2:1]/[2.35:1]/[2.39:1]

- The safety zone is not displayed on the images that is actually recorded.
- The safety zone is displayed on the LCD monitor. It is not displayed on the external monitor.



## [CENTER MARKER]

CAM

SDI

Displays/hides the center marker.

[ON]/[OFF]

## [DATE/TIME]

CAM

SDI



It is possible to change the date and time display mode.

[OFF]/[TIME]/[DATE]/[DATE&TIME]

## [DATE FORMAT]

CAM

SDI



It is possible to change the date format.

[Y/M/D]/[M/D/Y]/[D/M/Y]

## [AUDIO LEVEL METER]

CAM

SDI



Select to display the audio level meter.

- (In Playback Mode)  
Touch the play mode select icon, and set this unit to Clip Playback Mode. (→ 83)

[ON]/[OFF]

## [LENS STATUS]

CAM

Display relating to lens can be switched. (Zoom Display, Image stabilization, ND filter, Focus Display, White Balance, Iris, Gain, Auto Iris, Shutter Speed)

[ON]/[OFF]

## [CARD & BATTERY]

CAM

SDI



Display can be switched between the remaining recordable time of the SD card and the remaining battery capacity indication.

[ON]/[OFF]

## [OTHER DISPLAY]

CAM

SDI



This shows or hides indications on the screen except for [USER BUTTON DISPLAY], [GUIDE LINES], [SAFETY ZONE], [CENTER MARKER], [DATE/TIME], [AUDIO LEVEL METER], [LENS STATUS] and [CARD & BATTERY].

[ON]/[OFF]

## [POWER LCD]

CAM

SDI



This makes it easier to view the LCD monitor in bright places including outdoors. (→ 38)

[+1]/[0]/[-1]

## [LCD SET]

CAM

SDI



It adjusts brightness and color density on the LCD monitor. (→ 38)

[COLOR]/[BRIGHTNESS]/[CONTRAST]

- The default settings are as follows:
  - [COLOR]: “0”
  - [BRIGHTNESS]: “0”
  - [CONTRAST]: “0”

## [LCD DETAIL]

CAM

SDI

The outline of the LCD monitor image is enhanced, making it easier to focus when [ON] is set. (→ 49)

[ON]/[OFF]

## [LCD PEAK LEVEL]

CAM

SDI

Adjusts the emphasis strength for [LCD DETAIL]. (→ 49)

- This function's default setting is “0”.

## [LCD PEAK FREQ.]

CAM

SDI

Sets the peaking frequency for [LCD DETAIL]. (→ 49)

[HIGH]/[LOW]

## [LCD REVERSE]

CAM

SDI



The LCD monitor can be displayed reversed vertically and horizontally. (→ 38)

[ON]/[OFF]

## [OPERATION ICONS DISPLAY]

CAM

SDI



Sets the display duration of operation icons. Operation icons disappear when the set duration elapses.

[1 SEC.]/[2 SEC.]/[3 SEC.]/[4 SEC.]/[5 SEC.]

## [OTHER FUNCTION]

Different menu items are displayed depending on whether this unit is in Recording Mode or Playback Mode. All default settings are indicated with underlined text.

 : **[OTHER FUNCTION]** → **desired setting**

### [CLOCK SET]

**CAM** **SDI** 

Set date and time. (→ 36)

### [TIME ZONE]

**CAM** **SDI** 

Set the time difference from Greenwich Mean Time. (→ 36)

### [POWER UP OPTION]

**CAM** **SDI** 

Sets the boot condition when the AC adaptor or the battery is connected to this unit.

<b>[NORMAL]:</b>	This unit is not turned on when the power supply is connected.
<b>[ALWAYS ON]:</b>	This unit turns on automatically when the power supply is connected.
<b>[PREVIOUS STATE]:</b>	The same setup as [NORMAL] is applied when this unit is turned off by pressing the power button. The same setup as [ALWAYS ON] is applied when this unit is turned off by the battery going dead, or when the AC adaptor/battery is removed.

- If you turn off the unit without pressing the power button by, for example, disconnecting the AC adaptor from the AC outlet, the unit will not memorize the zoom and focus positions, iris and gain values, and shutter speed at that point in time. To have the unit remember the last-used positions and values when it is turned on, follow either of the steps below to have it memorize them.
  - Turn off the unit by pressing the power button.
  - Switch to Playback Mode.

### [ECONOMY (BATT)]

**SDI** 

When about 5 minutes have passed without any operation, this unit automatically turns off to save battery life.

- **(In case of Playback Mode)**  
**Start up the unit in SDI Mode, and press the MODE button to switch to Playback Mode.**

#### [ON]/[OFF]

- [ECONOMY (BATT)] operates only during SDI Mode. This will not operate during CAM Mode.
- This unit will not automatically turn off even if the [ECONOMY (BATT)] is set to [ON] in following cases:
  - During pause of playback
  - PRE-REC is used (→ 70, 214)
  - The unit and a PC are connected with a USB 2.0 cable (→ 106)

## [ECONOMY (AC)]

SDI

When connected to AC adaptor about 15 minutes have passed without any operation, this unit automatically turns off.

- (In case of Playback Mode)  
Start up the unit in SDI Mode, and press the MODE button to switch to Playback Mode.

### [ON]/[OFF]

- [ECONOMY (AC)] operates only during SDI Mode. This will not operate during CAM Mode.
- This unit will not automatically turn off even if the [ECONOMY (AC)] is set to [ON] in following cases:
  - During pause of playback
  - PRE-REC is used (→ 70, 214)
  - The unit and a PC are connected with a USB 2.0 cable (→ 106)

## [SYSTEM FREQ]



Set the system frequency of this unit. (→ 40)

## [TOUCH SCREEN]

CAMSDI

Enables/disables the touch operation of the LCD monitor.

### [ENABLE]/[DISABLE]

## [CLIP NUMBER RESET]

CAMSDI

Sets the file number of the next MP4 clip or still picture to be recorded to 0001.

- Folder number is updated and file number will start from 0001. (→ 107)
- To reset the folder number, format the SD card, and then perform [CLIP NUMBER RESET].

## [DISPLAY MENU]

CAM

Either the normal menu or the Camera Text Menu to be displayed when the operation to open menu on the remote camera controller is performed via network when the camera head is connected can be selected.

<b>[TOUCH]:</b>	Displays normal menu to the LCD monitor of this unit and the output destination of the HDMI OUT/SDI OUT terminal. The menu is not displayed on the IP image.
<b>[TEXT]:</b>	Displays the Camera Text Menu on the IP image as superimposed text. The menu is not displayed on the LCD monitor of this unit and the output destination of the HDMI OUT/SDI OUT terminal.

- It is not possible to display/output the normal menu and the Camera Text Menu at the same time.
- To display the menu on the HDMI/SDI output destination, set [CHAR OUTPUT] to [ON]. (→ 219)

## [INITIAL SET]

CAM

SDI

The menu settings or [SELECT SCENE] are reset to the default. (→ 200)

<b>[ALL]:</b>	This is for initializing all menus.*1
<b>[SCENE]:</b>	This is for initializing the setting of each scene number of [SELECT SCENE].*2
<b>[USER]</b>	Initializes the setup other than [SELECT SCENE] and [NETWORK SETUP].*1
<b>[NETWORK]:</b>	This is for initializing the [NETWORK SETUP] menu settings.

\*1 Settings for [CLOCK SET], [TIME ZONE], [SYSTEM FREQ] and [LANGUAGE] will not be changed.

\*2 Not displayed during SDI Mode.

- Returning all settings to the default is not possible during Freeze Frame. (→ 69)
- If you select [ALL] or [NETWORK] in CAM Mode, the settings of [CAMERA LAN SETUP] will be initialized, while if you select it in SDI Mode, the settings of [RECORDER LAN SETUP] will be initialized.

## [LANGUAGE]

CAM

SDI



You can select the language on the screen display and the menu screen.

[ 日本語 ]/[English]/[ 中文 ]

## [NETWORK SETUP]

MENU  : [NETWORK SETUP] → desired setting

### [RECORDER LAN SETUP]

SDI

The network setup of this unit, such as IP address, subnet mask, and MAC address, can be changed or confirmed. (→ 128)

[DHCP]/[IP Address]/[Subnet Mask]/[Gateway]/[DNS]/[Primary DNS]/[Secondary DNS]/[MAC Address]

### [CAMERA LAN SETUP]

CAM

The network setup of the camera head, such as IP address, subnet mask, and MAC address, can be changed or confirmed. (→ 128)

[DHCP]/[IP Address]/[Subnet Mask]/[Gateway]/[DNS]/[Primary DNS]/[Secondary DNS]/[MAC Address]

## [MAINTENANCE]

Different menu items are displayed depending on whether this unit is in Recording Mode or Playback Mode.

 : [MAINTENANCE] → desired setting

### [VERSION]

Displays the model name, serial number, and firmware version of this unit or the camera head.

### [UPDATE]

Updates the firmware of this unit or the camera head.

For the most current information regarding the update, confirm at the following support site.  
<https://pro-av.panasonic.net/>

- Updating is not possible with illegal firmware files.
- Connect the AC adaptor before updating, and do not turn off the unit while updating is in progress.  
Keep in mind that if the unit is turned off, the update will not complete.

### [HOUR METER]

Displays the energizing time of this unit or the camera head, operating time of the cooling fan, and displaying time of the LCD monitor.

## [PLAYBACK SETUP]



All default settings are indicated with underlined text.

- **Press the MODE button to switch this unit to the Playback Mode.**

 : [PLAYBACK SETUP] → desired setting

### [REPEAT PLAY]

Playback of the first clip starts after playback of the last clip finishes when set to [ON]. (→ 87)

- **Touch the Play Mode selection icon, and set to Clip Playback Mode (→ 83)**

[ON]/[OFF]

### [RESUME PLAY]

If playback of a clip was stopped halfway, the playback can be resumed from where it was stopped when set to [ON]. (→ 88)

- **Touch the Play Mode selection icon, and set to Clip Playback Mode (→ 83)**

[ON]/[OFF]

### [PICTURE MEDIA SELECT]

You can specify the card slot to which still pictures are to be recorded.

- You can save the desired frame of a recorded clip as a still picture. (→ 87)

[SD CARD 1]/[SD CARD 2]

## [OPERATION]

---

- Press the **MODE** button to switch this unit to the **Playback Mode**. 

 : [OPERATION] → desired setting

## [PROTECT]

---

Clips and still pictures can be protected so that they are not deleted by mistake.  
(Even if you protect some clips/still pictures, formatting the SD card will delete them.) (→ 90)

## [DELETE]

---

Deletes clips and still pictures. (→ 89)

## [COPY]

---

Selects and copies the clip/still picture to copy between the SD cards of this unit. (→ 91)

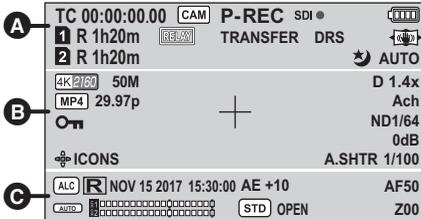
[ 1 → 2 ]/[ 2 → 1 ]

# Indications

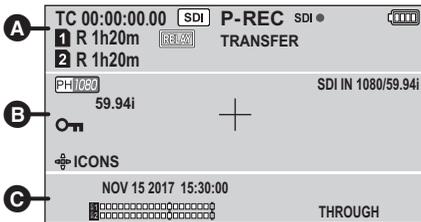
- \*1 Not displayed during SDI Mode.
- \*2 Not displayed during CAM Mode.

## ■ Recording indications

(During CAM Mode)



(During SDI Mode)



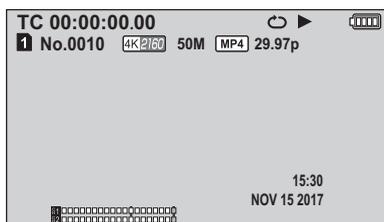
<b>A</b>	
TC 00:00:00.00/TC 00:00:00.00	Counter display (→ 62)
<b>P-</b>	PRE-REC (→ 70, 214)
<b>P-REC (Red)</b>	PRE-REC (Recording)
<b>REC (Red)</b>	Recording
<b>REC (Flashing red)</b>	Recording pause
<b>SDI ●, SDI II</b>	REMOTE REC (→ 71)
<b>CAM, SDI</b>	Operation Mode
	Remaining battery power (→ 26)
<b>1, 2 (White)</b>	Recording to card possible (motion picture)
<b>1, 2 (Green)</b>	Card is being recognized (motion picture)
<b>R 1h20m</b>	Remaining time for motion picture recording (→ 41)
	Card slot at the recording destination (→ 40, 41)
<b>TRANSFER</b>	During FTP transfer (→ 169)

<b>DRS</b>	DRS (→ 68, 206) <sup>*1</sup>
	Freeze Frame (→ 69)
	Image stabilization (→ 47) <sup>*1</sup>
	Infrared recording (→ 69, 210) <sup>*1</sup>
<b>AUTO</b>	Auto Mode (→ 43), The title of the scene number (→ 200) <sup>*1</sup>
<b>B</b>	
4K 2160, PS1080, PH1080, PH 720, HA1080, HE1080, PM 720	
Recording format (→ 212)	
<b>50M</b>	Bit rate (→ 212) <sup>*1</sup>
<b>D 1.4x, D 2x, D 4x, D 6x, D 8x</b>	Digital Zoom (→ 68) <sup>*1</sup>
<b>SDI IN 1080/59.94i</b>	SDI input format (→ 95) <sup>*2</sup>
	MP4 recording <sup>*1</sup>
<b>29.97p, 25.00p, 23.98p</b> Frame rate (→ 212)	
<b>ATW, LOCK, P3200K, P5600K, VAR, Ach, Bch</b> White Balance (→ 52) <sup>*1</sup>	
	Key lock (→ 76)
<b>CLEAR</b>	ND filter (→ 80) <sup>*1</sup>
<b>ND1/4, ND1/16, ND1/64</b>	
	Center Marker (→ 224)
<b>AGC, 0dB</b>	Gain value (→ 56) <sup>*1</sup>
	Multi Manual Function (→ 78)
<b>A.SHTR</b>	Auto Shutter display (→ 58) <sup>*1</sup>
<b>1/100</b>	Shutter speed (→ 58) <sup>*1</sup>
<b>1/100.0</b>	Synchro Scan (→ 59) <sup>*1</sup>

	Time Stamp is turned on (→ 214) <sup>*1</sup>
	When [AUDIO ALC] is enabled (→ 61)
<b>NOV 15 2017 15:30:00</b>	Time Stamp (→ 214) <sup>*1</sup>
<b>NOV 15 2017 15:30:00</b>	Date indication
	Time indication (→ 36)
<b>AE+10</b>	AE level (→ 54) <sup>*1</sup>
<b>AF50, MF50, , </b>	
	Focus (→ 48) <sup>*1</sup>
,	[AUDIO LEVEL] (→ 61)
□□□□□□□□□□□□□□□□□□□□ □□□□□□□□□□□□□□□□□□□□	
	Audio level meter (→ 61)
	Auto iris mode (→ 54) <sup>*1</sup>
	Backlight Compensation (→ 55) <sup>*1</sup>
	Spotlight compensation (→ 55) <sup>*1</sup>
<b>OPEN, F2.0</b>	Iris value (→ 54) <sup>*1</sup>
<b>THROUGH</b>	When [SDI MODE SEL] is set to [THROUGH] (→ 94) <sup>*2</sup>
<b>Z00, iZ00</b>	Zoom magnification (→ 46) <sup>*1</sup>
	i.ZOOM (→ 46) <sup>*1</sup>

## ■ Playback indications

Example: Display in English



▶, II, ▶▶, ▶▶▶, ◀◀, ◀◀◀, ▶, ◀, ▶▶, ◀◀, ▶, ◀, II▶, ◀◀

Display during playback (→ 83, 86)

TC 00:00:00.00/TC 00:00:00:00

Counter Display (→ 62)

<b>1, 2 (White)</b>	Card slot number
<b>No.0010</b>	Clip Number
<b>100-0001</b>	Still picture folder/file name
	Repeat Playback (→ 87)
<b>15:30</b>	Time indication (→ 36)

<b>NOV 15 2017</b>	Date indication (→ 36)
<b>1, 2 (White)</b>	Card slot selected as the recording destination of still pictures (→ 229)
, ,	
	Number of recording pixels for still pictures (→ 87)
	In Playback Mode, the picture size is not displayed for still pictures recorded with other products that have different picture sizes from the sizes shown above.
<b>R3000</b>	Remaining number of still pictures (→ 87)
	Recording still picture (→ 87)
,	
	Recording mode (When thumbnails are displayed) (→ 83)
<b>10</b>	Clip Number (In 9-clip display in thumbnail mode) (→ 83)
, , , , ,	
	Recording format (When thumbnails are displayed) (→ 83, 212)
	Resume Playback (in thumbnail view) (→ 88)
	Protected motion pictures/still pictures (in thumbnail view) (→ 90)

## ■ Indication of connection to other devices

Accessing the card (→ 106)

## ■ Confirmatory indications

-- (Time display) The built-in battery is low. (→ 36)

SD card is not inserted.

SD card is write-protected.

SD card is non-compatible.

SD card is full.

Playback-only SD card

# Messages

Major confirmation/error messages to be indicated on the screen in text.

## During recording/playback

Display	Description	Behavior and cause
<b>CHECK CARD.</b>	The SD card is not supported by this unit.	<ul style="list-style-type: none"> <li>• Check the SD card.</li> </ul>
<b>This card cannot record clips.</b>	This is displayed when the SD card has a capacity of less than 4 GB.	<ul style="list-style-type: none"> <li>• Use an SD card with a capacity of 4 GB or more.</li> </ul>
<b>INCOMPATIBLE CARD. CHECK CARD SPEED.</b>	This is displayed if the maximum writing speed of the SD card is not fast enough.	<ul style="list-style-type: none"> <li>• The operation will continue.</li> <li>• Use an SD card with a maximum writing speed that is fast enough.</li> </ul>
<b>CANNOT BE USED DUE TO INCOMPATIBLE DATA.</b>	The SD card cannot be used with this unit.	<ul style="list-style-type: none"> <li>• Insert a recordable SD card.</li> </ul>
<b>Cannot be used due to incompatible data. Use another card.</b>		
<b>CANNOT RECORD - INCOMPATIBLE CONTROL DATA.</b>	The content versions do not match. This is displayed when the SD card contains clips recorded with another device, for example.	<ul style="list-style-type: none"> <li>• Match the device and content version.</li> </ul>
<b>REC STOPPED. NOW WRITING.</b>	This is displayed when the SD card is removed during recording or data cannot be written to the SD card correctly.	<ul style="list-style-type: none"> <li>• Check the SD card.</li> </ul>
<b>ERROR OCCURRED. PLEASE TURN UNIT OFF, THEN TURN ON AGAIN.</b>	This is displayed if the SD card is removed or writing to the SD card fails while recording is in progress. It is also displayed when the lens of the Camera Head does not move.	<ul style="list-style-type: none"> <li>• Check the SD card.</li> <li>• Turn off and on this unit, and then check to see if the lens moves.</li> </ul>
<b>Cannot record. The number of clips has exceeded the maximum limit.</b>	No additional clips can be recorded to the SD card.	<ul style="list-style-type: none"> <li>• Delete unnecessary clips, or use a new SD card.</li> </ul>
<b>CANNOT RECORD - DATE CAPACITY IS FULL.</b>	This is displayed when you try to record in excess of the maximum number of clips allowed for one SD card.	<ul style="list-style-type: none"> <li>• The operation will stop.</li> <li>• Replace the SD card or delete unnecessary clips.</li> </ul>
<b>Cannot record - Playlist capacity is full.</b>		
<b>INVALID</b>	This is displayed when the operation is invalid.	<ul style="list-style-type: none"> <li>• Before performing the operation, wait until this unit is ready for it.</li> </ul>

Display	Description	Behavior and cause
<b>ERROR - UNABLE TO REPAIR DATA.</b>	This is displayed when the management information cannot be recovered.	<ul style="list-style-type: none"> <li>● Check the SD card.</li> </ul>
<b>Cannot use SD card in recording mode, control data error.</b>		<ul style="list-style-type: none"> <li>● The operation will stop.</li> <li>● Use another SD card to perform recording.</li> </ul>
<b>CONTROL DATA ERROR HAS BEEN DETECTED. (SD CARD)</b>	Defective management information has been found.	<ul style="list-style-type: none"> <li>● The management information will be automatically recovered after this message is displayed.</li> </ul>
<b>CANNOT PLAY.</b>	This is displayed when an error in the recording folder name or file name has occurred, for example.	<ul style="list-style-type: none"> <li>● Check the SD card.</li> </ul>
<b>Cannot play this clip on this model.</b>	The clip cannot be played back because it was recorded with another device.	<ul style="list-style-type: none"> <li>● Play back the scene with the device with which it was recorded.</li> </ul>

## During thumbnail and menu operation

Display	Description	Behavior and cause
<b>NO DATA.</b>	There are no clips in the currently selected recording mode option and recording format option.	<ul style="list-style-type: none"> <li>• Select a recording mode option or recording format option containing recorded clips.</li> </ul>
<b>CANNOT DELETE.</b>	The content versions do not match. This is displayed when you try to delete clips recorded with another device, for example.	<ul style="list-style-type: none"> <li>• Match the device and content version.</li> </ul>
<b>CARD ERROR. PLEASE REFORMAT.</b>	This is displayed when the SD card cannot be formatted.	<ul style="list-style-type: none"> <li>• Check the SD card.</li> <li>• Replace the SD card in the card slot at which the error has occurred.</li> </ul>
<b>UNABLE TO FORMAT.</b>	Formatting is not possible due to, for example, a problem with the SD card.	<ul style="list-style-type: none"> <li>• Check the SD card.</li> </ul>
<b>Cannot delete data on card.</b>	The SD card cannot be formatted.	
<b>CANNOT PROTECT.</b>	The content versions do not match. This is displayed when you try to set protection for clips recorded with another device, for example.	<ul style="list-style-type: none"> <li>• Match the device and content version.</li> </ul>
<b>CANNOT RESET NUMBER.</b>	The SD card cannot be used with this unit.	<ul style="list-style-type: none"> <li>• Insert a recordable SD card.</li> </ul>
<b>THUMBNAIL RECOVERY HAS FAILED.</b>	This is displayed if the SD card is removed or writing to the SD card fails while recovery is in progress.	<ul style="list-style-type: none"> <li>• Check the SD card.</li> </ul>
<b>THUMBNAIL DATA ERROR IS DETECTED.</b>	This is displayed when thumbnail information is not recorded correctly.	<ul style="list-style-type: none"> <li>• The applicable thumbnail information will be recovered after this message disappears.</li> </ul>
<b>Can not select more clips.</b>	The number of clips that can be selected with this unit has reached the maximum limit.	<ul style="list-style-type: none"> <li>• Reselect clips after finishing the current editing task.</li> </ul>
<b>SCENE FILE WRITE FAILED</b>	This is displayed if the SD card is removed or writing to the SD card fails while a scene file is being saved.	<ul style="list-style-type: none"> <li>• Check the SD card.</li> </ul>

## During USB Device mode

Display	Description	Behavior and cause
<b>DISCONNECT USB CABLE.</b>	An error has occurred while accessing the SD card, or the OS is not supported.	<ul style="list-style-type: none"> <li>• Check the SD card.</li> <li>• Check to see if the OS is supported.</li> </ul>

## During copying between SD cards

Display	Description	Behavior and cause
<b>Use destination SD card formatted with same as source SD card.</b>	This is displayed when the SD card format (FAT32/exFAT)* differs between the SD card of the copy source and that of the copy destination. * FAT32 is a format used for SDHC memory cards. exFAT is a format used for SDXC memory cards.	<ul style="list-style-type: none"> <li>● Check the format of the SD card of the copy destination.</li> </ul>
<b>CANNOT COPY.</b>	This is displayed when the system frequency (59.94 Hz/50.00 Hz) of AVCHD clips differs between those recorded on the SD card of the copy source and those recorded on the SD card of the copy destination. (AVCHD clips with different system frequencies cannot be recorded to the same media.)	<ul style="list-style-type: none"> <li>● Copy the AVCHD clips to a recordable SD card. Use an SD card containing clips with the same system frequency.</li> </ul>
<b>Exceeds capacity. Please reselect.</b>	There is not enough space on the SD card.	<ul style="list-style-type: none"> <li>● Replace the SD card of the copy destination or delete unnecessary clips.</li> </ul>
<b>This clip cannot be copied.</b>	This is displayed when one or more of the clips you are trying to copy cannot be played back on this unit.	<ul style="list-style-type: none"> <li>● Copy clips except for the ones that cannot be copied.</li> </ul>
<b>Cannot copy: contains recordings from other devices.</b>	This is displayed when a copy-related operation involving a clip recorded with another device is performed.	<ul style="list-style-type: none"> <li>● Copy only the clips recorded with this unit.</li> </ul>
<b>CANNOT SELECT BY DATE ANY MORE.</b>	This is displayed when no more clips can be selected after the maximum limit is reached, for example.	<ul style="list-style-type: none"> <li>● After finishing copying, reselect the desired dates.</li> </ul>
<b>CANNOT COPY - DATE CAPACITY IS FULL.</b>	This is displayed when no more clips can be copied after the maximum limit set by applicable standards is reached, for example.	<ul style="list-style-type: none"> <li>● Use an SD card with enough recordable space.</li> </ul>
<b>CANNOT COPY - THE NUMBER OF CLIPS HAS REACHED MAXIMUM.</b>		
<b>Could not copy some clips.</b>		
<b>COPY FAILED. PLEASE CHECK THE CARD.</b>	An error has occurred while accessing the SD card.	<ul style="list-style-type: none"> <li>● Check the SD card.</li> </ul>
<b>COPY FAILED DUE TO ERROR ON SD CARD.</b>	This is displayed when an attempt to access the SD card in this unit fails.	
<b>CARD LOCKED.</b>	The write-protect switch of the copy destination SD card is locked.	<ul style="list-style-type: none"> <li>● Unlock the write-protect switch of the SD card.</li> </ul>

# Warning Indications

If a problem is detected immediately after the unit is turned on or while you are operating it, the status indicator and an on-screen display report the problem.

<b>System error</b>	<b>Status indicator</b>	It flashes once per second.
	<b>On-screen display</b>	—
	<b>Meaning of the warning</b>	A reference signal error or communication error has occurred.
	<b>Recording/playback</b>	The operation stops.
	<b>Solution</b>	Turn off and on this unit. If the warning persists, consult your dealer.
<b>The battery is depleted (Low input voltage)</b>	<b>Status indicator</b>	It flashes once per second.
	<b>On-screen display</b>	The message [LOW BATTERY.] is displayed.
	<b>Meaning of the warning</b>	The battery is depleted.
	<b>Recording/playback</b>	The operation stops. This unit turns off automatically.
	<b>Solution</b>	Charge or replace the battery. Connect the AC adaptor to cancel the warning.
<b>Low input voltage to the DC input terminal</b>	<b>Status indicator</b>	It flashes once per second.
	<b>On-screen display</b>	The message [Low DC power] is displayed.
	<b>Meaning of the warning</b>	The voltage entering the DC input terminal is low.
	<b>Recording/playback</b>	The operation stops. This unit turns off automatically.
	<b>Solution</b>	Attach a charged battery.
<b>The card is full</b>	<b>Status indicator</b>	—
	<b>On-screen display</b>	The remaining recordable time flashes red when it reaches [R 0h00m].
	<b>Meaning of the warning</b>	The SD card capacity is full.
	<b>Recording/playback</b>	The recording stops.
	<b>Solution</b>	Delete unnecessary clips, or use a new SD card.

<b>Recording error</b>	<b>Status indicator</b>	It flashes once per second.
	<b>On-screen display</b>	—
	<b>Meaning of the warning</b>	A recording error or recording circuit setting error has occurred.
	<b>Recording/playback</b>	The recording may either continue or stop.
	<b>Solution</b>	Turn off and on this unit. If the warning persists, consult your dealer.
<b>Card error</b>	<b>Status indicator</b>	—
	<b>On-screen display</b>	[  ] is displayed.
	<b>Meaning of the warning</b>	An SD card error has occurred during recording or playback.
	<b>Recording/playback</b>	The operation stops.
	<b>Solution</b>	Replace the SD card.
<b>The battery will be depleted soon</b>	<b>Status indicator</b>	—
	<b>On-screen display</b>	The message [CHANGE THE BATTERY.] is displayed and  flashes red.
	<b>Meaning of the warning</b>	The battery will be depleted soon.
	<b>Recording/playback</b>	The operation continues.
	<b>Solution</b>	Charge or replace the battery as needed. Connect the AC adaptor to cancel the warning.
<b>The card is nearly full</b>	<b>Status indicator</b>	—
	<b>On-screen display</b>	The remaining recordable time flashes red. (When it is less than 1 minute)
	<b>Meaning of the warning</b>	The SD card is almost out of space.
	<b>Recording/playback</b>	The recording continues.
	<b>Solution</b>	Delete unnecessary clips or use a new SD card as needed.
<b>The cooling fan has stopped</b>	<b>Status indicator</b>	It flashes twice per second.
	<b>On-screen display</b>	—
	<b>Meaning of the warning</b>	A cooling fan error has stopped the cooling fan.
	<b>Recording/playback</b>	The operation stops and this unit turns off automatically.
	<b>Solution</b>	Check to see if the air inlet or outlet is blocked. If the warning persists, consult your dealer.

# Event log

Examples of event logs displayed in the system log tab of the maintenance screen in the web screen are shown below.  
 (→ 184)

Event code	Description	Explanation of the content
<b>W:0001</b>	<Power> Recorder system start.	<ul style="list-style-type: none"> <li>The system has been started with the Recorder. (The power supply has started)</li> </ul>
<b>W:0002</b>	<Power> Camera head system start.	<ul style="list-style-type: none"> <li>The system has been started with the Camera Head. (The power supply has started after connecting the unit and the Camera Head)</li> </ul>
<b>W:0003</b>	<Power> Recorder power on.	<ul style="list-style-type: none"> <li>The Recorder has been turned on.</li> </ul>
<b>W:0004</b>	<Power> Camera head power on.	<ul style="list-style-type: none"> <li>The Camera Head has been turned on.</li> </ul>
<b>W:0005</b>	<Power> Recorder power off.	<ul style="list-style-type: none"> <li>The Recorder has been turned off.</li> </ul>
<b>W:0006</b>	<Power> Camera head power off.	<ul style="list-style-type: none"> <li>The Camera Head has been turned off.</li> </ul>
<b>W:0007</b>	<Power> Recorder standby.	<ul style="list-style-type: none"> <li>The Recorder has entered standby mode.</li> </ul>
<b>W:0008</b>	<Power> Camera head standby.	<ul style="list-style-type: none"> <li>The Camera Head has entered standby mode.</li> </ul>
<b>W:0009</b>	<Power> Camera head cannot be found.	<ul style="list-style-type: none"> <li>The Camera Head cannot be detected.</li> </ul>
<b>W:0010</b>	<Power> Camera head cannot be used.	<ul style="list-style-type: none"> <li>The Camera Head cannot be used.</li> </ul>
<b>W:0011</b>	<Power> System error. Turn off.	<ul style="list-style-type: none"> <li>Either the Recorder or both the Recorder and the Camera Head have been turned off due to a system error.</li> </ul>
<b>W:0012</b>	<Power> The Camera head and Recorder versions are different.	<ul style="list-style-type: none"> <li>The versions of the Camera Head and the Recorder do not match.</li> </ul>
<b>W:1001</b>	<Maintenance> Succeeded Recorder firmware update.	<ul style="list-style-type: none"> <li>The firmware of the Recorder has been successfully updated.</li> </ul>
<b>W:1002</b>	<Maintenance> Succeeded Camera head firmware update.	<ul style="list-style-type: none"> <li>The firmware of the Camera Head has been successfully updated.</li> </ul>
<b>W:1003</b>	<Maintenance> Reset to default (ALL settings).	<ul style="list-style-type: none"> <li>The Camera Text Menu or the web screen menu has been initialized.</li> </ul>
<b>W:1004</b>	<Maintenance> Reset to default (SCENE FILE settings).	<ul style="list-style-type: none"> <li>The scene file menu has been initialized.</li> </ul>
<b>W:1005</b>	<Maintenance> Reset to default (USER FILE settings).	<ul style="list-style-type: none"> <li>The user file menu has been initialized.</li> </ul>
<b>W:1006</b>	<Maintenance> Reset to default (NETWORK settings).	<ul style="list-style-type: none"> <li>The network setup menu has been initialized.</li> </ul>
<b>W:1007</b>	<Maintenance> Reset to default (except NETWORK settings from WEB).	<ul style="list-style-type: none"> <li>Menus other than the web screen network setup menu have been initialized.</li> </ul>
<b>W:1008</b>	<Maintenance> Reboot.	<ul style="list-style-type: none"> <li>The unit has rebooted.</li> </ul>
<b>W:1009</b>	<Maintenance> Save the USER FILE.	<ul style="list-style-type: none"> <li>The setting data for [USER FILE] has been saved successfully.</li> </ul>

Event code	Description	Explanation of the content
W:1010	<Maintenance> Save the SCENE FILE.	<ul style="list-style-type: none"> <li>The setting data for [SCENE FILE] has been saved successfully.</li> </ul>
W:1011	<Maintenance> Load the USER FILE.	<ul style="list-style-type: none"> <li>The setting data for [USER FILE] has been loaded successfully.</li> </ul>
W:1012	<Maintenance> Load the SCENE FILE.	<ul style="list-style-type: none"> <li>The setting data for [SCENE FILE] has been loaded successfully.</li> </ul>
W:1013	<Maintenance> Succeeded configuration data upload.	<ul style="list-style-type: none"> <li>[Upload] (→ 186) has been executed and the setting data has been uploaded successfully.</li> </ul>
W:1014	<Maintenance> Succeeded configuration data download.	<ul style="list-style-type: none"> <li>[Download] (→ 186) has been executed and the setting data has been downloaded successfully.</li> </ul>
W:1015	<Maintenance> Failed configuration data upload.	<ul style="list-style-type: none"> <li>[Upload] has been executed, but the uploading of the setting data has failed (→ 186).</li> </ul>
W:1101	<SD Card> Slot1 NO CARD.	<ul style="list-style-type: none"> <li>An SD card is not inserted in card slot 1 when [MEDIA SELECT] is set to [SD CARD 1].</li> </ul>
W:1102	<SD Card> Slot2 NO CARD.	<ul style="list-style-type: none"> <li>An SD card is not inserted in card slot 2 when [MEDIA SELECT] is set to [SD CARD 2].</li> </ul>
W:1103	<SD Card> Card Error.	<ul style="list-style-type: none"> <li>Check the card.</li> </ul>
W:1104	<SD Card> Card full.	<ul style="list-style-type: none"> <li>The card is full.</li> </ul>
W:1105	<SD Card> Rec start.	<ul style="list-style-type: none"> <li>Recording on the SD card has started.</li> </ul>
W:1106	<SD Card> Rec stop.	<ul style="list-style-type: none"> <li>Recording on the SD card has stopped.</li> </ul>
W:1107	<SD Card> Start CLIP file download.	<ul style="list-style-type: none"> <li>Downloading of the clip file has started.</li> </ul>
W:1108	<SD Card> Succeeded CLIP file download.	<ul style="list-style-type: none"> <li>Downloading of the clip file has finished successfully.</li> </ul>
W:1109	<SD Card> Failed CLIP file download.	<ul style="list-style-type: none"> <li>Downloading of the clip file has failed.</li> </ul>
W:1110	<SD Card> Started card format.	<ul style="list-style-type: none"> <li>Formatting of the SD card has started.</li> </ul>
W:1111	<SD Card> Succeeded formatting of SD Card.	<ul style="list-style-type: none"> <li>Formatting of the SD card has finished successfully.</li> </ul>
W:1112	<SD Card> Failed formatting of SD Card.	<ul style="list-style-type: none"> <li>Formatting of the SD card has failed.</li> </ul>
W:1113	<SD Card> Completed restoring SD card data.	<ul style="list-style-type: none"> <li>Management information for the SD card has been restored correctly.</li> </ul>
W:1114	<SD Card> SD Card write speed error.	<ul style="list-style-type: none"> <li>Recording has stopped because a writing speed error has occurred in the SD card during the recording.</li> </ul>
W:1115	<SD Card> Card read/write error.	<ul style="list-style-type: none"> <li>A reading/writing error has occurred in the SD card during recording.</li> </ul>
W:1301	<SD Copy> Copying failed due to card error.	<ul style="list-style-type: none"> <li>An SD card error has resulted in copy failure.</li> </ul>
W:1302	<SD Copy> Cannot copy due to error on card.	<ul style="list-style-type: none"> <li>Copying has failed due to a card error.</li> </ul>

Event code	Description	Explanation of the content
<b>W:1303</b>	<SD Card> SCENE FILE read error.	● Reading of the scene file has failed.
<b>W:1304</b>	<SD Card> SCENE FILE write error.	● Writing of the scene file has failed.
<b>W:1305</b>	<SD Card> USER FILE read error.	● Reading of the user file has failed.
<b>W:1306</b>	<SD Card> USER FILE write error.	● Writing of the user file has failed.
<b>W:1307</b>	<SD Card> Clip deleted.	● The clip has been deleted.
<b>W:1201</b>	<Date&time> Date&time exchanged.	● The date and time have been set.
<b>W:1202</b>	<NTP> No response from the NTP server.	● Connection to the NTP server has failed due to an error in accessing date information.
<b>W:1203</b>	<FTP> FTP server transmission start.	● Transmission to the FTP server has started.
<b>W:1204</b>	<FTP> Succeeded FTP server transmission.	● Transmission to the FTP server has finished successfully.
<b>W:1205</b>	<FTP> Failed FTP server transmission.	● Transmission to the FTP server has failed.
<b>W:1206</b>	<HTTPS> Self-signed Certificate - Generated.	● Generation of the self-signed certificate is complete.
<b>W:1207</b>	<HTTPS> Self-signed Certificate - Deleted.	● Deletion of the self-signed certificate is complete.
<b>W:1208</b>	<HTTPS> Certificate Signing Request - Generated.	● Generation of the certificate signing request is complete.
<b>W:1209</b>	<HTTPS> CA Certificate - Installed.	● Installation of the server certificate is complete.
<b>W:1210</b>	<HTTPS> CA Certificate - Deleted.	● Deletion of the server certificate is complete.
<b>W:1211</b>	<HTTPS> Previous CRT key - Applied.	● The previous CRT key has been applied as the CRT key.
<b>W:1212</b>	<HTTPS> CRT key - Generated.	● Generation of the CRT key is complete.
<b>W:1213</b>	<System> Recorder fatal error occurred.	● A fatal error has been detected in the Recorder. Turn off and on the Recorder.
<b>W:1214</b>	<System> Camera head fatal error occurred.	● A fatal error has been detected in the Camera Head. Turn off and on the Camera Head.
<b>W:1215</b>	<Power> Recorder fan lock error occurred.	● A fan lock error has been detected in the Recorder.
<b>W:1216</b>	<Power> Camera head fan lock error occurred.	● A fan lock error has been detected in the Camera Head.

# Troubleshooting

## ■ It is not a malfunction in following cases

<b>The lens or LCD monitor fog up.</b>	<ul style="list-style-type: none"> <li>• This is due to condensation. This is not a malfunction. Please refer to page 14.</li> </ul>
<b>When the camera head is shaken, it makes “rattling” sound.</b>	<ul style="list-style-type: none"> <li>• This is the sound of the lens moving and is not a defect. This sound will no longer be heard when the unit is turned on and switch to Recording Mode.</li> </ul>
<b>There is abnormal sound in the camera head.</b>	<ul style="list-style-type: none"> <li>• There will be operation sound during boot, switching of operation mode, or zoom operation. This is not malfunction of the camera head.</li> </ul>
<b>Object seems to be warped.</b>	<ul style="list-style-type: none"> <li>• Object seems to be warped slightly when the object moves across the image very fast, but this is because the unit is using MOS for the image sensor. This is not a malfunction.</li> </ul>
<b>When the flash is fired during shooting, only the top or bottom of the screen becomes lighter</b>	<ul style="list-style-type: none"> <li>• With a MOS image sensor, the shooting timing differs slightly between the top left and bottom right of the screen. This means that when the flash is fired, the bottom of the screen will become lighter in the field concerned and the top will become lighter in the next field. This is not a malfunction.</li> </ul>

## ■ Power

Problem	Check points
<p><b>This unit cannot be turned on.</b></p> <p><b>This unit does not stay on long enough.</b></p> <p><b>Battery runs down quickly.</b></p>	<ul style="list-style-type: none"> <li>• Connect the Camera Head Optional cable correctly. (→ 29)</li> <li>• Charge the battery again to ensure it is sufficiently charged. (→ 24)</li> <li>• In cold places, the battery using time becomes shorter.</li> <li>• The battery has a limited life. If the operating time is still too short even after the battery is fully charged, the battery has worn out and needs to be replaced.</li> <li>• Securely connect the AC adaptor to the AC outlet.</li> <li>• Confirm if the AC cable of the AC adaptor is correctly connected.</li> </ul>
<p><b>This unit cannot be operated though it is turned on.</b></p> <p><b>This unit does not operate normally.</b></p>	<ul style="list-style-type: none"> <li>• Remove the battery or AC adaptor, wait about 1 minute and then reconnect the battery or AC adaptor. Then about 1 minute later, turn on the unit again. (Conducting the above operation while the SD card is being accessed may damage the data on the media.)</li> <li>• If normal operation is still not restored, detach the power connected, and consult the dealer who you purchased this unit from.</li> </ul>
<p><b>“ERROR OCCURRED. PLEASE TURN UNIT OFF, THEN TURN ON AGAIN.” is displayed.</b></p>	<ul style="list-style-type: none"> <li>• The unit has automatically detected an error. Restart the unit by turning off and on.</li> <li>• The unit will be turned off in about 1 minute if the unit is not turned off and on.</li> <li>• Repair is needed if it is repeatedly displayed even if it is restarted. Detach the power connected, and consult the dealer who you purchased this unit from. Do not attempt to repair the unit by yourself.</li> </ul>
<p><b>The status indicator flashes a few times in red.</b></p>	<ul style="list-style-type: none"> <li>• An error such as an attempt to perform a recording operation while an SD card is not inserted has occurred. Check the event log. (→ 184, 239)</li> </ul>

## ■ Indication

Problem	Check points
Function display (Remaining Display, Counter Display, etc.) is not displayed.	<ul style="list-style-type: none"> <li>● [CARD &amp; BATTERY] or [OTHER DISPLAY] of the [DISP SETUP] is [OFF]. (→ 224)</li> <li>● Switch the counter display by pressing the USER button assigned as &lt;COUNTER&gt;. (→ 62)</li> </ul>
Nothing is displayed even though the unit is turned on.	<ul style="list-style-type: none"> <li>● Is the LCD monitor turned off? Press the USER1 button while pressing and holding the SHIFT button to turn on the LCD monitor. (→ 78)</li> </ul>

## ■ Recording

Problem	Check points
Recording does not start.	<ul style="list-style-type: none"> <li>● Confirm if the Operation Mode is CAM Mode. Connect the Camera Head Optional cable to this unit and the camera head correctly while this unit is turned off, and then turn this unit on. (→ 29, 31) This unit will not go into CAM Mode if you connect the cable while this unit is turned on.</li> </ul>
The unit arbitrarily stops recording.	<ul style="list-style-type: none"> <li>● Use an SD card that can be used for motion picture recording. (→ 27)</li> <li>● The recordable time may have shortened due to the deterioration of the data writing speed or repeated recording and deletion. Using the unit, format the SD card. (→ 40)</li> </ul>
Auto Focus function does not work.	<ul style="list-style-type: none"> <li>● If you are trying to record a scene which is hard to bring into focus in Auto Focus Mode, use the Manual Focus Mode to adjust the focus. (→ 48)</li> <li>● (With the controller) Press the [AUTO] button for focus control to switch to Manual Focus, and adjust the focus manually.</li> </ul>
Color or brightness of the image changes, or you may see horizontal bars in the image. The LCD monitor flickers indoors.	<ul style="list-style-type: none"> <li>● Color or brightness of the image may change, or you may see horizontal bars in the image when the object is recorded under fluorescent light, mercury light or sodium light, etc., but this is not a malfunction.</li> <li>● Record images in Auto Shutter Mode or adjust the shutter speed to 1/50, 1/60 or 1/100.</li> <li>● Adjust the Synchro Scan shutter speed. (→ 59)</li> </ul>
No pictures are displayed or the pictures are disturbed Image is not recorded.	<ul style="list-style-type: none"> <li>● Confirm if the connected device is correctly connected. When this unit is connected to the camera head, confirm if these devices are connected with the Camera Head Optional cable.</li> <li>● If the system is configured to switch the image when a camera to operate is selected, confirm if correct camera is selected.</li> <li>● Confirm if the image signal setup is correctly selected. (→ 96)</li> </ul>
The picture is flipped vertically	<ul style="list-style-type: none"> <li>● Check the settings of [LCD REVERSE] and [SCAN REVERSE]. (→ 38, 39)</li> </ul>
The Camera Text Menu is displayed.	<ul style="list-style-type: none"> <li>● (When performing the operations using the controller) Press the [CAMERA OSD] button to exit the camera menu.</li> </ul>
It is difficult to view the Camera Text Menu screens	<ul style="list-style-type: none"> <li>● Depending on the monitor you are using, you may experience one or more of the symptoms described below, but these are not malfunctions. <ul style="list-style-type: none"> <li>– The resolution of the characters in the menu displays changes as the background image changes.</li> <li>– Depending on the edge enhancement setting established for the monitor, white lines appear in front of the black shadows of the menus.</li> <li>– Depending on the edge enhancement setting established for the monitor, the background colors may be superimposed onto the white parts of the menus.</li> </ul> </li> </ul>

Problem	Check points
<b>The subject is not brought into focus during zooming when the manual setting is used for the focus</b>	<ul style="list-style-type: none"> <li>● First adjust the focus at the Tele end where the focusing accuracy is higher, and then proceed with the zooming.</li> <li>● Under some operating conditions, it may be hard to bring subjects into focus. In such cases, use the focus at the auto setting (→ 48, 137)</li> </ul>
<b>Cannot focus in the Infrared Recording Mode.</b>	<ul style="list-style-type: none"> <li>● Are you shooting in visible light? The focus position is different between the visible light and the infrared light due to difference in the refraction index. This unit assumes infrared light with wave length of approximately 850 nm for Infrared Recording Mode. Execute manual adjustment if necessary. (→ 48, 137)</li> </ul>
<b>The images appear jerky when 29.97p, 25.00p or 23.98p is selected.</b>	<ul style="list-style-type: none"> <li>● This is normal operation. Images may appear somewhat jerky from time to time.</li> </ul>
<b>Something is wrong with the coloring of the pictures</b>	<ul style="list-style-type: none"> <li>● Activate the ATW (Auto tracking white adjustment) function. (→ 52)</li> <li>● In some situations, the proper colors may not be reproduced using the ATW function. In cases like this, proceed with the white balance adjustment. (→ 53)</li> <li>● (When performing the operations using the controller) Perform menu setup and switch to ATW. [SW SETUP]→[WHITE BALANCE MODE]→[ATW]</li> </ul>
<b>The pictures are too light or too dark</b>	<ul style="list-style-type: none"> <li>● Use the ND filters to adjust light intensity. (→ 80, 207)</li> <li>● Either select the auto setting for the iris or select the manual setting and adjust the iris manually. (→ 54, 207)</li> <li>● Set [AUTO SHUTTER LIMIT] to [OFF]. (→ 159, 209) (When performing the operations using the controller)</li> <li>● Press the [AUTO] button for IRIS to switch to auto iris adjustment.</li> <li>● Press the [AUTO] button for GAIN to switch to auto gain adjustment.</li> </ul>
<b>The images are in black and white</b>	<ul style="list-style-type: none"> <li>● Images may be output in black and white in Infrared Recording Mode. (→ 69, 160)</li> <li>● Is the [CHROMA LEVEL] set to a value close to the lower limit? (→ 203)</li> </ul>
<b>The auto white balance adjustment (AWB) does not work</b>	<ul style="list-style-type: none"> <li>● Auto White Balance (AWB) is not possible in the Infrared Recording Mode. (→ 69, 160)</li> </ul>
<b>The screen is too bright in the Infrared Recording Mode. Iris cannot be operated in the Infrared Recording Mode.</b>	<ul style="list-style-type: none"> <li>● The iris is set up to fully open in the Infrared Recording Mode to prevent camera voyeurism. Adjust the brightness with the light source. (→ 69, 160)</li> </ul>
<b>When fine lines or cyclical patterns are shot, flickering is seen or coloring is added to them</b>	<ul style="list-style-type: none"> <li>● This phenomenon occurs because the pixels are arranged systematically on each image sensor. It is noticeable when the spatial frequency of a subject and the pixel pitch are brought into proximity so change the camera angle or take other such action.</li> </ul>
<b>Noise occurs in the audio input</b>	<ul style="list-style-type: none"> <li>● Confirm the following. <ul style="list-style-type: none"> <li>– Are the Camera Head, the unit, the switching hub, or other peripheral devices grounded?</li> <li>– Are power lines are running nearby?</li> <li>– Is equipment generating strong electric or magnetic fields (e.g., television and radio antennas, air conditioning compressors, power transformers) located nearby?</li> </ul> </li> <li>● If the noise is not reduced via movement of surrounding devices, use a microphone equipped with an amplifier, or connect an audio output with low output impedance.</li> </ul>

## ■ Playback

Problem	Check points
Clips/still pictures cannot be played back.	<ul style="list-style-type: none"> <li>Any clips/still pictures where the thumbnails are displayed as  cannot be played back.</li> <li>In most cases,  is displayed for the following clips: <ul style="list-style-type: none"> <li>Clips recorded with another device or edited with editing software</li> <li>Clips with damaged data</li> </ul> </li> <li>The thumbnails of clips with different system frequencies are indicated with . You can play them back by changing the [SYSTEM FREQ] setting. (→ 40)</li> </ul>
Clips/still pictures cannot be deleted.	<ul style="list-style-type: none"> <li>Release the protect setting. (→ 90)</li> <li>It may not be possible to delete the following clips/still pictures: <ul style="list-style-type: none"> <li>any clips/still pictures where the thumbnails are displayed as </li> </ul>           If the clips/still pictures are unnecessary, format the SD card to erase the data. (→ 40) Please be aware that if a SD card is formatted then all the data recorded on the SD card is erased and cannot be recovered. Back up important data on a PC etc.         </li> </ul>

## ■ With other products

Problem	Check points
Although this unit is correctly connected to an external monitor, images cannot be seen. The images are squeezed horizontally.	<ul style="list-style-type: none"> <li>Please read the operating instructions of your external monitor and select the channel that matches the input used for the connection.</li> <li>Change the setting of the unit depending on the cable connecting to the external monitor. (→ 96)</li> </ul>
Even when this unit is connected to the external monitor by the HDMI cable, images or sounds are not output.	<ul style="list-style-type: none"> <li>Check if the HDMI cable is connected correctly.</li> <li>Insert the HDMI cable all the way in.</li> <li>Check what signals are supported by the HDMI monitor.</li> </ul>
If the SD card is inserted in another device, it is not recognized.	<ul style="list-style-type: none"> <li>Check that the device is compatible with the capacity or type of SD card (SDHC Memory Card/SDXC Memory Card) that you inserted. Refer to the operating instructions of the device for details.</li> </ul>

## ■ With a PC

Problem	Check points
When connected by the USB Cable, this unit is not detected by the PC.	<ul style="list-style-type: none"> <li>After re-inserting the SD card into the unit, reconnect the USB Cable.</li> <li>Select another USB terminal on the PC.</li> <li>Check the operating environment. (→ 105)</li> <li>Connect the USB Cable again after restarting the PC and turning on this unit again.</li> </ul>
When the USB Cable is disconnected, an error message will appear on the PC.	<ul style="list-style-type: none"> <li>To disconnect the USB Cable safely, double-click the  icon in the task tray and follow the instructions on the screen.</li> </ul>

## ■ Others

Problem	Check points
If the SD card is inserted in this unit, it is not recognized.	<ul style="list-style-type: none"> <li>If the SD card is formatted on a PC, it may not be recognized by this unit. Use this unit to format SD cards. (→ 40)</li> </ul>

## ■ Remote camera controller

Problem	Check points
Cannot operate using the controller	<ul style="list-style-type: none"> <li>Controller operations cannot be performed in the following cases. <ul style="list-style-type: none"> <li>When the unit is turned off (the operation indicator of the unit is turned off)</li> <li>When the unit is in standby mode (the operation indicator is flashing slowly)</li> <li>During Playback Mode</li> </ul> </li> <li>Correctly select this unit to operate.</li> </ul>
	<ul style="list-style-type: none"> <li>Connect correctly with the controller. Refer to the Operating Instructions of the controller.</li> <li>It may be necessary to upgrade the version of the controller so that the controller will support the unit.</li> </ul>
Slow response to the controller	<ul style="list-style-type: none"> <li>This may occur when recording to the SD card and using IP streaming (JPEG) simultaneously with [PRIORITY MODE] set to [REC/PB(4K)]. Lower the frame rate and image quality of the IP streaming (JPEG).</li> </ul>

## ■ Web screen

Problem	Check points
No access is possible from the web browser	<ul style="list-style-type: none"> <li>Connect the LAN cable with Category 5 or above to the IP control LAN terminal.</li> </ul>
	<ul style="list-style-type: none"> <li>Confirm illumination of the [LINK] LED on the IP control LAN terminal. If it is not lit, it means that something is wrong with the connection to the LAN or that the network at the connection destination is not working properly. Check the LAN cable for defective contacts, and check the wiring.</li> </ul>
	<ul style="list-style-type: none"> <li>Confirm if this unit is turned on. If the operation indicator of the unit is turned off, the unit is turned off.</li> </ul>
	<ul style="list-style-type: none"> <li>When not using the DHCP function, set a valid IP address for the unit. (→ 166)</li> </ul>
	<ul style="list-style-type: none"> <li>Confirm if wrong IP address is accessed. Connection can be confirmed by the following methods. <p><b>[When using Windows]</b> Using the Windows command prompt, execute &gt; ping [IP address which has been set in the camera] A reply returned from the unit signifies that there are no problems in operation.</p> <p><b>[When using Mac]</b> Using the OS X terminal, execute &gt; ping -c 10 [IP address which has been set in the camera] A reply returned from the unit signifies that there are no problems in operation.</p> </li> </ul>

Problem	Check points
<b>No access is possible from the web browser</b>	<ul style="list-style-type: none"> <li>● Perform access via “https://” when using the HTTPS function. Entry of the port number is also required. (→ 179)</li> </ul>
	<ul style="list-style-type: none"> <li>● Confirm if the set IP address is not duplicate of another device.</li> <li>● Check out the IP addresses of the unit, access devices (PC/mobile terminal/controller, etc.) and any other cameras.</li> </ul>
	<ul style="list-style-type: none"> <li>● Confirm if the set subnet mask matches the network subnet mask at the installation. Check out the subnet mask settings of the unit and access devices, and then consult with the network administrator. (→ 128, 166)</li> </ul>
	<ul style="list-style-type: none"> <li>● Confirm if the web browser is set to [Use proxy server]. (When this unit is connected to the same subnet mask as the PC) If a proxy server has been set using the “proxy setting” of the web browser, it is recommended that a “Don’t use proxy” address be selected as the unit’s IP address setting.</li> <li>● Confirm the default gateway set in this unit. (When this unit is connected to a different subnet mask as the PC) Check out the default gateway that has been set for the unit, and then consult with the network administrator. (→ 128, 166)</li> </ul>
	<ul style="list-style-type: none"> <li>● The network may get disconnected when the PC goes into sleep. After canceling the sleep mode, reload the screen as necessary.</li> </ul>
	<b>Cannot access the Camera Head or the unit from the mobile terminal.</b>
<b>[Reached the concurrent access limit.] is displayed in the main area</b>	<ul style="list-style-type: none"> <li>● The number of users who are accessing the unit at the same time has exceeded the maximum limit.</li> <li>● Depending on the frame rate and image quality of the transmitted image, the number of users who can access the unit at the same time varies.</li> </ul>
<b>[H.264] cannot be selected</b>	<ul style="list-style-type: none"> <li>● [H.264] cannot be selected when the Priority Mode selection is anything other than “IP”. Only JPEG images can be displayed on the Live screen. (→ 32, 144)</li> </ul>
<b>The images are not refreshed</b>	<ul style="list-style-type: none"> <li>● The images may not be refreshed or other trouble may occur with some web browsers or their version which is being used.</li> <li>● Image display may be suspended if the network is congested or the unit is being accessed excessively.</li> <li>● When the IP video settings of the unit have been changed, the display of the images may be suspended temporarily. Check the status of access to the unit, and stop any access which can be suspended. Then take one of the following steps. <b>[When using Windows]</b> Press the [F5] key on the keyboard of the PC to request that the settings be acquired. <b>[When using Mac]</b> Press the [Command] + [R] keys on the keyboard of the PC to request that the settings be acquired. <b>[When using a mobile terminal]</b> Refresh the screen by, for instance, pressing the [Refresh] button of the web browser to request that the settings be acquired.</li> </ul>

Problem	Check points
<p><b>The settings on the web setting screen are not updated or displayed properly</b></p>	<p><b>[When using Windows]</b></p> <ul style="list-style-type: none"> <li>• Install the plug-in viewer software. (→ 127)</li> <li>• If “Every time I visit the webpage” is not selected for “Check for newer versions of stored pages” in the Temporary Internet Files settings, the IP videos on the Live screen may not be displayed properly.</li> </ul> <p>Follow the steps below.</p> <ol style="list-style-type: none"> <li>➊ In Internet Explorer, select [Tools] → [Internet Options].</li> <li>➋ Click the [General] tab, and click the [Settings] button in “Browsing history”.</li> <li>➌ In the [Temporary Internet Files and History Settings] dialog box, under “Check for newer versions of stored pages”, set the radio button ON for [Every time I visit the webpage].</li> <li>➍ Click the [OK] button.</li> </ol>
	<ul style="list-style-type: none"> <li>• <b>[When using Windows]</b> Press the [F5] key on the keyboard of the PC to request that the settings be acquired.</li> <li>• <b>[When using Mac]</b> Press the [Command] + [R] keys on the keyboard of the PC to request that the settings be acquired.</li> </ul>
	<ul style="list-style-type: none"> <li>• Follow the steps below to delete the temporary Internet files (Cache).</li> </ul> <p><b>[When using Windows]</b></p> <ol style="list-style-type: none"> <li>➊ In Internet Explorer, select [Tools] → [Internet Options].</li> <li>➋ Click the [General] tab, and click the [Delete...] button in “Browsing history”.</li> <li>➌ In the [Delete Browsing History] dialog box, set the check box of “Temporary Internet files” to ON, and click the [Delete] button.</li> <li>➍ Click the [OK] button.</li> </ol> <p><b>[When using Mac]</b></p> <ol style="list-style-type: none"> <li>➊ In Safari, select [Safari] → [Empty Cache...].</li> <li>➋ Click the [Empty] button in “Are you sure you want to empty the cache?” pop-up.</li> </ol>
	<ul style="list-style-type: none"> <li>• <b>[When using Windows]</b> If “Every time I visit the webpage” is not selected for “Check for newer versions of stored pages” in the Temporary Internet Files settings, the web setting screen may not be displayed properly. Follow the steps below.</li> </ul> <ol style="list-style-type: none"> <li>➊ In Internet Explorer, select [Tools] → [Internet Options].</li> <li>➋ Click the [General] tab, and click the [Settings] button in [Browsing history].</li> <li>➌ In the [Temporary Internet Files and History Settings] dialog box, under [Check for newer versions of stored pages], set the radio button to ON for [Every time I visit the webpage].</li> <li>➍ Click the [OK] button.</li> </ol>
	<ul style="list-style-type: none"> <li>• The unit’s ports may be filtered by the firewall or other function of the anti-virus software. Change the HTTP port number of the unit to a port number which will not be filtered.</li> </ul>
<p><b>It is not possible to download the files</b></p>	<ul style="list-style-type: none"> <li>• <b>[When using Windows]</b> The file download function may be disabled. Follow the steps below to check the setting of the function.</li> </ul> <ol style="list-style-type: none"> <li>➊ In Internet Explorer, select [Tools] → [Internet Options].</li> <li>➋ Click the [Security] tab, and click the [Custom level...] button in “Security level for this zone”.</li> <li>➌ In the [Security Settings] dialog box, under “File download”, set the [Enable] radio button to ON.</li> <li>➍ Click the [OK] button.</li> <li>➎ Click the [OK] button.</li> </ol>

Problem	Check points
<b>The authentication screen appears repeatedly</b>	<ul style="list-style-type: none"> <li>● Has the user name or password been changed? If you change the user name and password of the user currently logged in from a separate web browser while the unit is being accessed, the authentication screen appears each time the screen display is changed. Close the web browser, and initiate access to the unit again. (→ 164, 165)</li> </ul>
	<ul style="list-style-type: none"> <li>● Has the method for user authentication been changed? If you change the [User auth.] → [Authentication] setting, close the web browser and initiate access again. (→ 164)</li> </ul>
<b>Screens displays take a while to appear and operations are slower</b>	<ul style="list-style-type: none"> <li>● The display becomes slower when accessing with the HTTPS mode due to decryption.</li> </ul>
	<ul style="list-style-type: none"> <li>● If this unit is located on the same local network and is being accessed via proxy, set the web browser so it will not go through a proxy.</li> </ul>
	<ul style="list-style-type: none"> <li>● When multiple users access the unit's IP videos at the same time, image display and operations may take some time to occur, and the refresh speed of the IP videos may drop.</li> </ul>
	<ul style="list-style-type: none"> <li>● Depending on the performance of the PC, the screen display images will be displayed later than the actual images if the H.264 image format is set to 1920×1080 (60fps or 50fps). Also, the motion of the screen display images may not be smooth immediately after opening the web screen. (→ 149)</li> </ul>
	<ul style="list-style-type: none"> <li>● This may occur when recording to the SD card and using IP streaming (JPEG) simultaneously with [PRIORITY MODE] set to [REC/PB(4K)]. Lower the frame rate and image quality of the IP streaming (JPEG).</li> </ul>
<b>H.264 images are not displayed</b>	<ul style="list-style-type: none"> <li>● A firewall or some other function may be filtering UDP traffic. Allow UDP traffic or set [Internet mode (over HTTP)] to [On] to view H.264 images by using HTTP communication. (→ 149)</li> </ul>
<b>The images break up</b>	<ul style="list-style-type: none"> <li>● Convergence of transmission lines or some other factor may be making it impossible for the video information to be transmitted properly, causing the images to break up. Consult with the network administrator.</li> </ul>
<b>The screen goes dark when the mobile terminal is left standing for a while</b>	<ul style="list-style-type: none"> <li>● Turn the power-saving function of the mobile terminal OFF so that images are displayed at all times.</li> </ul>
<b>When multiple web browsers are running to display H.264 images, multiple images appear sequentially in a single web browser.</b>	<ul style="list-style-type: none"> <li>● <b>[When using Windows]</b> This may occur depending on the combination of the PC display adaptor and the driver. If this occurs, first update the driver of the display adaptor to the latest version. If this does not resolve the problem, adjust the hardware accelerator function as follows. This section describes the procedure for Windows 7 as an example. Changing the settings may not be possible, depending on your environment. <ol style="list-style-type: none"> <li>➊ Right-click on the desktop, and select [Screen Resolution] from the menu.</li> <li>➋ Click [Advanced settings].</li> <li>➌ Select the [Troubleshoot] tab, and click [Change setting].</li> <li>➍ If the [User Account Control] dialog box appears, click [Yes]. (When logged on with an account other than an administrator account, enter the password (and user name if necessary), and click [Yes].)</li> <li>➎ Change to [Hardware acceleration] setting to [None] at the far left, and click [OK].</li> </ol> </li> </ul>

Problem	Check points
<p><b>An unnecessary status bar or scroll bar is displayed on the pop-up window</b></p>	<ul style="list-style-type: none"> <li>● Open the security settings screen for Internet Explorer, and select [Internet]. Click the [Custom level] button, set [Allow script-initiated windows without size or position constraints] to [Enable] under [Miscellaneous], and click the [OK] button. When the warning window appears, click the [Yes] button.</li> </ul>
<p><b>The images do not fit the frame used for display</b></p>	<ul style="list-style-type: none"> <li>● Images may not be displayed correctly if you use the DPI setting of the monitor or the zoom function of Internet Explorer while the web browser is open. Press the [F5] key or perform a similar update operation to fix the problem.</li> <li>● If a setting other than 100 % has been selected as the magnification level used for the zoom function of Internet Explorer, the images may not be displayed properly.</li> </ul>
<p><b>An unnecessary scroll bar is displayed, the layout of the screen is distorted, the screen tabs are not displayed, or some buttons on the screen do not operate</b></p>	<ul style="list-style-type: none"> <li>● Select [Tools] - [Compatibility View Settings] in the menu bar of Internet Explorer, disable compatibility view for the unit.</li> </ul>

## ■ Web browser settings

Depending on the OS installed on the personal computer, the following may occur. Follow the instructions below when the following has occurred. The measures below will not affect the operation of other applications or compromise security.

### [When using Windows]

The “information bar” described in the following explanations refers to the message bars that appear in Internet Explorer.

The information bar **A** appears at the bottom of Internet Explorer.



Problem	Check points
The following message appears in the information bar. “This website wants to run the following add-on: ‘Web*****’ from ‘Panasonic System Networks Co., Ltd.’.”	<ul style="list-style-type: none"> <li>• Select [Allow].</li> </ul>
The following message appears in the information bar. “This website wants to install the following add-on: ‘nwcv4SSetup.exe’ from ‘Panasonic System Networks Co., Ltd.’.”	<ul style="list-style-type: none"> <li>• Select [Install]. When the security warning window appears, click the [Install] button.</li> </ul>

## ■ If AVCHD clips do not change smoothly when played back on another device

The images may be still for several seconds at the joins between the clips if the following operations are performed when multiple clips have been continuously played back using another device.

- Just how smoothly the clips will be played back depends on the playback device. Depending on the device used, the images may stop moving and become still for a moment even when none of the following conditions are applicable.
- A continuous recording of motion picture data that exceeds 4 GB may momentarily stop at every 4 GB of data when played back with another device.

Principal reasons for not playing back smoothly
• When the clips were recorded in different recording formats by switching between [PS] and another setting.
• When the clips were recorded on different dates
• When clips lasting under 3 seconds have been recorded
• When PRE-REC was used for recording
• When deleting clips
• When clips recorded more than 99 scenes on the same date

## About recovery

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If faulty management information is found, the messages may appear and a repair is performed. (Repairing may take time depending on the error.)

-  is displayed when abnormal management information is detected when the clips are displayed in thumbnail.
- 
- Use a sufficiently charged battery or the AC adaptor.
  - Depending on the condition of the data, it may not be possible to completely repair the data.
  - If recovery fails, it will not be possible to play back clips recorded before the unit turned off.
  - When data recorded on another device is recovered, it may not be possible to play back the data on this unit or the other device.
  - If recovery fails, turn the unit off and on again after waiting awhile. If recovery fails repeatedly, format a media on the unit. Please be aware that if a media is formatted, then all the data recorded on the media will be erased.
  - If the thumbnail information is recovered, displaying the thumbnails may become slower.

# About copyright

**Transferring, copying, disassembling, decompiling or reverse engineering the software included in this unit, or exporting it in violation of export laws is prohibited.**

## ■ Carefully observe copyright laws

### IMPORTANT

**“Unauthorized recording of copyrighted television programs, video tapes and other materials may infringe the right of copyright owners and be contrary to copyright laws.”**

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# Recording modes/approximate recordable time

- SD cards are only mentioned with their main memory size. The stated times are the approximate recordable times for continuous recording.
- “h” is an abbreviation for hour, “min” for minute and “s” for second.
- If recording for long periods, prepare batteries for 3 or 4 times the period you wish to record for. (→ 26)
- The default setting for [PRIORITY MODE] is [REC/PB], and the default setting for [REC FORMAT] is [PH 1080/59.94i].
- Maximum continuously recordable time: Approx. 10 hours
- Recording stops momentarily when the continuous recording time reaches approx. 10 hours, and then it resumes automatically after a few seconds. Nothing will be recorded for a few seconds until the recording resumes.
- The recordable time may be reduced if recording with a lot of action is recorded or recording of short clips is repeated.
- The recordable times depends on the recording condition or card type to be recorded.
- For information on picture sizes, frame rates, and bit rates in [REC FORMAT], refer to page 212.

## • When [PRIORITY MODE] is set to [REC/PB(4K)]

Recording format	System frequency setting (→ 40)	SD card		
		4 GB	16 GB	64 GB
[4K 2160/29.97p 50M]	[59.94Hz]	10 min	40 min	2 h 40 min
[4K 2160/23.98p 50M]				
[4K 2160/25.00p 50M]				
	[50.00Hz]			

## • When [PRIORITY MODE] is set to [REC/PB]

Recording format	System frequency setting (→ 40)	SD card		
		4 GB	16 GB	64 GB
[PS 1080/59.94p]	[59.94Hz]	19 min	1 h 20 min	5 h 20 min
[PH 1080/59.94i]		21 min	1 h 30 min	6 h
[PH 1080/23.98p]				
[PH 720/59.94p]		30 min	2 h	8 h 30 min
[HA 1080/59.94i]		1 h 30 min	6 h 40 min	27 h 30 min
[HE 1080/59.94i]		1 h	4 h 15 min	17 h 10 min
[PM 720/59.94p]		21 min	1 h 30 min	6 h
[PH 1080/59.94i FROM 720p]*		30 min	2 h	8 h 30 min
[HA 1080/59.94i FROM 720p]*		1 h 30 min	6 h 40 min	27 h 30 min
[HE 1080/59.94i FROM 720p]*				
[PS 1080/50.00p]	[50.00Hz]	19 min	1 h 20 min	5 h 20 min
[PH 1080/50.00i]		21 min	1 h 30 min	6 h
[HA 1080/50.00i]		30 min	2 h	8 h 30 min
[HE 1080/50.00i]		1 h 30 min	6 h 40 min	27 h 30 min
[PM 720/50.00p]		1 h	4 h 15 min	17 h 10 min
[PH 1080/50.00i FROM 720p]*		21 min	1 h 30 min	6 h
[HA 1080/50.00i FROM 720p]*		30 min	2 h	8 h 30 min
[HE 1080/50.00i FROM 720p]*		1 h 30 min	6 h 40 min	27 h 30 min

\* Can be set only during SDI Mode.

## Approximate number of recordable pictures

- SD cards are only mentioned with their main memory size. The stated number is the approximate number of recordable pictures.

Picture size	Aspect ratio	SD card		
		4 GB	16 GB	64 GB
 3840×2160	16:9	750	3000	12000
 1920×1080		3200	12500	52000
 1280×720		7000	29000	118000

- Maximum number of recordable pictures that can be displayed is 9999. If the number of recordable pictures exceeds 9999, R 9999+ is displayed. The number will not change when the picture is taken until the number of recordable pictures is 9999 or less.
- The number of recordable pictures depends on the recording condition or card type to be recorded.
- The memory capacity indicated on the label of an SD card is the total of the capacity for copyright protection and management and the capacity which can be used on the unit, a PC etc.



## General

### Power:

DC (==) 7.28 V (When using battery)  
DC (==) 12 V (When using AC adaptor)

### Current consumption:

When only SDI recording is used;  
1.1 A (When using battery)  
0.7 A (When using AC adaptor)  
When the special optional camera head  
(AG-UCK20G) is connected for recording;  
2.2 A (When using battery)  
1.4 A (When using AC adaptor)

 indicates safety information

### Ambient operating temperature:

0 °C to 40 °C (32 °F to 104 °F)

### Ambient operating humidity:

10%RH to 80%RH (no condensation)

### Storage temperature:

-10 °C to 60 °C (14 °F to 140 °F)

### Storage humidity:

30%RH to 80%RH

### Storage atmospheric pressure:

500 hPa to 1060 hPa

### Mass (Weight):

Approx. 590 g (Approx. 1.3 lbs.)

### Dimensions (W×H×D):

100 mm×53.5 mm×140 mm  
[3-15/16"×2-3/32"×5-1/2"]  
(excluding protrusions)

## Memory card recorder

### Recording media:

SDHC Memory Card (4 GB to 32 GB)/  
SDXC Memory Card (48 GB to 128 GB);  
● MP4; Class 10 or above, AVCHD; Class 4 or above  
Refer to page 27 for details on SD cards usable in this unit.

### Recording slots:

2 slots

### System frequency:

59.94 Hz, 50.00 Hz

### Motion picture recording:

Recording method; MP4, AVCHD

Recording format;

● When [PRIORITY MODE] = [REC/PB(4K)]<sup>\*1</sup>  
(When [SYSTEM FREQ] = [59.94Hz])

[4K 2160/29.97p 50M]/  
[4K 2160/23.98p 50M];  
Average 50 Mbps (VBR)

(When [SYSTEM FREQ] = [50.00Hz])

[4K 2160/25.00p 50M];  
Average 50 Mbps (VBR)

\*1 Only when dedicated camera head AG-UCK20G is connected

● When [PRIORITY MODE] = [REC/PB]

(When [SYSTEM FREQ] = [59.94Hz])

[PS 1080/59.94p]; Average 25 Mbps (VBR)  
[PH 1080/59.94i]; Average 21 Mbps (VBR)  
[PH 1080/23.98p]; Average 21 Mbps (VBR)  
[PH 720/59.94p]; Average 21 Mbps (VBR)  
[HA 1080/59.94i]; Average 17 Mbps (VBR)  
[HE 1080/59.94i]; Average 5 Mbps (VBR)  
[PM 720/59.94p]; Average 8 Mbps (VBR)

(When [SYSTEM FREQ] = [50.00Hz])

[PS 1080/50.00p]; Average 25 Mbps (VBR)  
[PH 1080/50.00i]; Average 21 Mbps (VBR)  
[PH 720/50.00p]; Average 21 Mbps (VBR)  
[HA 1080/50.00i]; Average 17 Mbps (VBR)  
[HE 1080/50.00i]; Average 5 Mbps (VBR)  
[PM 720/50.00p]; Average 8 Mbps (VBR)

Refer to page 212 and 254 for the picture size and recordable time of a motion picture.

### 2 Slot function:

Relay

### Still picture recording:

Recording method;

JPEG corresponding DCF (Design rule for Camera File system, based on Exif 2.2 standard)

Refer to page 255 for picture size of a still picture and number of recordable pictures.

## Digital video

### Video signal for external output:

8 bit 4:2:2

### Recording video signal:

8 bit 4:2:0

### Video compression format:

MPEG-4 AVC/H.264 High Profile  
(MP4/AVCHD)

## Digital audio

### Recording audio signal:

48 kHz/16 bit 2CH

### Audio compression format:

MP4; Linear PCM (1.5 Mbps)  
AVCHD; Dolby Audio (PH/PS: 384 kbps, HA/HE/PM:  
256 kbps)

### Headroom:

12 dB

## Input/output

### Image input

#### SDI IN terminal:

BNC terminal × 1, 0.8 V [p-p], 75 Ω,  
3G/1.5G HD-SDI compatible

#### Input format:

1080/59.94p LEVEL-A/59.94p LEVEL-B,  
1080/29.97PsF/23.98PsF,  
1080/59.94i, 720/59.94p

1080/50.00p LEVEL-A/50.00p LEVEL-B,  
1080/25.00PsF,  
1080/50.00i, 720/50.00p

### Image output

#### SDI OUT terminal:

BNC terminal × 1, 0.8 V [p-p], 75 Ω,  
3G/1.5G HD-SDI compatible

#### Output format:

1080/59.94p LEVEL-A/59.94p LEVEL-B,  
1080/29.97PsF/23.98PsF,  
1080/59.94i, 720/59.94p

1080/50.00p LEVEL-A/50.00p LEVEL-B,  
1080/25.00PsF,  
1080/50.00i, 720/50.00p

#### HDMI OUT terminal:

HDMI × 1,

(HDMI Type A, not compatible with VIERA Link)

#### Output format:

2160/29.97p/23.98p,  
1080/59.94p/29.97p/23.98p/59.94i,  
720/59.94p, 480/59.94p

2160/25.00p,  
1080/50.00p/25.00p/50.00i,  
720/50.00p, 576/50.00p

### Audio input

#### MIC/LINE IN terminal:

Stereo mini jack 3.5 mm (0.14 ") diameter (for both  
MIC/LINE)

#### MIC:

–60 dBV  
(Microphone sensitivity –40 dB equivalent,  
0 dB=1 V/Pa 1 kHz),  
Compatible with plug-in power

#### LINE:

–10 dBV

### Audio output

#### SDI OUT terminal:

2ch (Linear PCM)

Gain settings: 0 dB/–6 dB/–12 dB (selectable menu)

#### HDMI OUT terminal:

2ch (Linear PCM)

#### Headphone output terminal:

3.5 mm (0.14 ") diameter stereo mini jack × 1

#### Speaker:

Round type speaker with a diameter of 20 mm (0.8 ") × 1

## External terminal

#### CAMERA terminal:

20-pin dedicated interface

#### LAN:

IP control LAN terminal (RJ-45)

With straight cable/crossover cable automatic  
recognition function

#### CAM REMOTE terminal:

2.5 mm (0.1 ") diameter super mini jack × 1

(ZOOM, S/S)

3.5 mm (0.14 ") diameter mini jack × 1 (FOCUS, IRIS)

#### USB 2.0 terminal:

Type Mini B terminal,

Mass storage function (read/write)

#### DC input terminal:

DC 12 V (DC 11.4 V to 12.6 V), EIAJ type 4

## Monitor

#### LCD monitor:

8.8 cm (3.5-inch) liquid crystal monitor (Approx.

1150000 dots)

## Network section

### System Frequency:

59.94 Hz/50.00 Hz

### Video compression format:

Motion JPEG,

MPEG-4 AVC/H.264 High Profile

### Audio compression format:

AAC-LC (48 kHz, 16bit, 2ch, 128 kbps)

### Transfer mode:

(JPEG)

Resolution	Frame rate*2	
	System Frequency 59.94Hz	System Frequency 50.00Hz
640×360	30 fps	25 fps
	15 fps	12.5 fps
	5 fps	5 fps

(H.264)

Resolution	Frame rate*2	
	System Frequency 59.94Hz	System Frequency 50.00Hz
3840×2160	60 fps*3	50 fps*3
1920×1080	30 fps	25 fps
1280×720	15 fps	12.5 fps
640×360	5 fps	5 fps

\*2 Frame rate may lower than the setup depending on the operating condition.

\*3 60 fps or 50 fps cannot be selected as the frame rate when the image resolution is [3840×2160] or [640×360].

### Compatible protocol:

<b>IPv4</b>	TCP/IP, UDP/IP, HTTP, HTTPS, RTSP, RTP, RTP/RTCP, FTP, DHCP, DNS, NTP, IGMP, UPnP, ICMP, ARP, RTSPoverTCP, RTSPoverHTTP, SSL(TLS), MultiCast/UniCast
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### IP connection cable:

LAN cable\*4 (Category 5 or above)

Maximum of 100 m (328 feet)

\*4 Recommended STP (Shielded Twisted Pair)

## Compatible controller

AW-RP50, AW-RP120, AK-HRP200

- Controllers may need to be upgraded to support this unit.

## AC adaptor

### Power source:

AC ~ 100 V to 240 V,

50 Hz/60 Hz, 1.2 A

### Power output:

DC === 12 V, 3.0 A

 indicates safety information

### Ambient operating temperature:

0 °C to 40 °C (32 °F to 104 °F)

### Ambient operating humidity:

10%RH to 90%RH (no condensation)

### Mass (Weight):

Approx. 225 g (Approx. 0.496 lbs.)

### Dimensions (W×H×D):

115 mm×37 mm×57 mm

[4-1/2" × 1-7/16" × 2-1/4"]

(Excluding the DC cord portion)

The symbols on this product (including the accessories) represent the following:

~	AC
===	DC
	Class II equipment (The construction of the product is double-insulated.)
I	ON
	Standby

**Panasonic Corporation**

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