VARICAM

35

4K PROFESSIONAL

Operating Guide

Panasonic

W1014HM0 -YI

VQT5K88A(E)

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How to read this document

■ Illustrations

- Screenshots or illustrations may differ from the actual product.

■ Conventions used in this manual

- Words and phrases in [ ] brackets indicate details and content displayed in the viewfinder or control panel.
- Words and phrases in < > brackets indicate design text used on this camera, such as button names.

■ Reference pages

- Reference pages in this document are indicated by (page 00).

■ Terminology

- SD memory card, SDHC memory card, and SDXC memory card are referred to as “SD memory card”.
- A memory card with the “P2” logo such as AJ-P2E064FG memory card (optional) is referred to as a “P2 memory card”.
- A memory card with the “microP2” logo such as AJ-P2M032AG memory card (optional) is referred to as a “microP2 memory card”.
- A memory card with the “expressP2” logo such as AU-XP0256AG memory card (optional) is referred to as a “expressP2 memory card”.
- P2 memory card, microP2 memory card, and expressP2 memory card are referred to only as “P2 card” unless distinguished otherwise.
- Video that is created during a single recording operation is referred to as a “clip”.

Contents

Chapter 1 Overview

Before using the camera, read this chapter.

Before using the camera

■ When using this product during rain or snow or when at the beach, be careful that water does not get inside the camera recorder.

Water causes damage to the camera recorder and memory card. (Repair may be impossible)

■ Keep the camera recorder away from devices (TVs, TV games, etc.) that produce magnetism.

- If you use the camera recorder near TVs, video and sound data may be distorted by electromagnetic waves.
- Strong magnetic fields produced by speakers and large motors may cause damage to recorded contents and may distort images.
- Electromagnetic waves emitted by microcomputers may have a harmful effect on the camera recorder and may corrupt video and sound data.
- The camera recorder may not operate properly if it receives harmful effects from devices that produce magnetism. In this case, turn off the camera recorder, and remove the battery. Next, attach the battery again. After that, turn on the camera recorder.

■ Do not use the camera recorder near radio transmitters or high-voltage devices.

If you use the camera recorder near radio transmitters or high-voltage devices, the recorded video and sound data may suffer harmful effects.

■ When using the camera recorder at the beach, etc., be careful that sand and dust do not get inside the camera recorder.

Sand and dust may damage the camera recorder and memory card. (Be careful when inserting and removing the memory card)

■ When carrying the camera recorder, be careful not to drop it.

- Strong shocks will damage the camera recorder body and it may not operate properly.

■ Do not apply insecticide or volatile materials to the camera recorder.

- If insecticide or volatile materials come into contact with the camera recorder, the camera recorder body may warp and the paint may come off.
- Do not allow the camera recorder to remain in contact with rubber or vinyl objects for a long period of time.

■ After using the camera recorder, be sure to remove the battery.

Be sure to remove the battery from the camera recorder. (If the battery is left in the camera recorder, it will continue to consume a small amount of electric current even when the power is turned off)

If the battery is left inside the camera recorder for a long time, it will over discharge and may become unusable even if it is recharged.

Do not remove the battery when the power is turned on.

Turn off the power and remove the battery after the operation lamp goes completely out.

■ Take proper care of the battery terminal.

Do not allow dust or foreign objects on the battery terminal.

Also, if you drop the battery by mistake, make sure that the battery body and the terminal are not warped.

Inserting a deformed battery into the camera recorder or attaching it to the battery charger may cause damages on the camera recorder or battery charger.

■ Cautions when throwing memory cards away or transferring them to others

Formatting memory cards or deleting data using the functions of the camera or a computer will merely change the file management information: it will not completely erase the data on the cards. When throwing these cards away or transferring them to others, either physically destroy them or use a data deletion program for computers (commercially available) to completely erase the data. Users are responsible for managing the data stored in their memory cards.

■ Control panel and viewfinder

- If the same image or letters are allowed to be displayed on the control panel for a long time, the image may be burned into the screen. It will return to normal after leaving the camera recorder turned off for several hours.
- Condensation sometimes forms on the LCD of the control panel in locations subject to extreme temperature differences. If this happens, wipe with a soft, dry cloth.
- If the camera recorder is very cold, the control panel will be slightly darker than normal immediately after the power is turned on. It will return to its regular brightness when the temperature inside increases.
- Since the viewfinder uses organic EL, if the same image or letters are allowed to be displayed for a long time, the image may be burned into the screen. There is no problem with the recorded images.

  Switch the screen by turning off the screen or by using the eye sensor, etc.
- The control panel and viewfinder monitor (organic EL) are highly-precisely managed so that at least 99.99% of the dots are effective pixels and 0.01% or less are invalid pixels and always lit. This is not a malfunction and it has no effect whatsoever on the recorded images.

■ Do not point the eye piece of the lens and viewfinder at the sun.

Doing so might damage the components inside.

■ GPS

GPS (Global Position System) satellite is managed by the United States Department of State and its precision is sometimes intentionally changed.

Position it in a location where there is a good view of the sky and there is no influence of obstacles such as roofs and trees, etc.

Depending upon the surrounding environment and the time, it may take a long time to position and errors may be larger.

■ Caution regarding laser beams

The MOS sensor may be damaged if the MOS sensor is subjected to light from a laser beam.

Take sufficient care to prevent laser beams from striking the lens when shooting in an environment where laser devices are used.

■ Note the following points.

- If you prepare to record important images, always shoot some advance test footage to verify that both pictures and sound are being recorded normally.
- Should video or audio recording fail due to a malfunction of the camera or the P2 cards used, we will not assume liability for such failure.
- Set up or check the calendar and time zone before recording. (page 31) These settings have an effect on the management and playback order of the recorded contents.

■ Software information about this product

1 This product includes software licensed under GNU General Public License (GPL) and GNU Lesser General Public License (LGPL), and customers are hereby notified that they have rights to obtain, re-engineer, and redistribute the source code of these software.

2 This product includes software licensed under MIT-License.

3 This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (http://www.openssl.org/).

4 This product includes software licensed under OpenBSD License.

5 This product includes PHP, freely available from <http://www.php.net/>.

6 This software is based in part on the work of the Independent JPEG Group.

7 This product includes software licensed under MOZILLA PUBLIC LICENSE.

For details on these descriptions (originally provided in English) and how to obtain the source code, visit the following website.

http://pro-av.panasonic.net/

We do not accept inquiries about the details of the source code obtained by the customer.

■ Precautions when installing USB drivers

For the latest information on the driver, visit the following website.

http://pro-av.panasonic.net/

- Install the required driver into your computer from the website.
- For installation procedure of the driver, refer to the installation manual on the website.

Accessories

Camera module

- Mount cap (already attached to the camera module)

Recording module

- Control panel extension unit
- Control panel mounting part

Electronic HD color viewfinder

- Connecting cable
- Slider unit
- Slider unit mounting screw (2 pcs.)
- Eye cup (already attached to the Electronic HD color viewfinder)
- Eye piece filter (already attached to the Electronic HD color viewfinder)

Shoulder mount module

- Slide rail (already attached to the shoulder mount module)

NOTE

- After unpacking the product, dispose of the packing material properly.

Use of the camera on a system

Use the following recommended parts.

Basic system devices

The following are required devices for shooting.

Part name	Part No.	Remark
VARICAM 35 Camera module*1	AU-V35C1G	“Assembling the camera module and recording module” (page 22)
Recording module*1	AU-VREC1G	“Assembling the camera module and recording module” (page 22)
Shoulder mount module	AU-VSHL1G	“Mounting the shoulder mount module” (page 24)
Electronic HD color viewfinder	AU-VCVF1G	“Mounting the Electronic HD color viewfinder” (page 23)
Lens (35 mm, PL mount)	ZEISS/COOKE/CANON/FUJINON, etc.	“Mounting the lens” (page 29)
Stereo microphone kit	AJ-MC900G	“Using front microphone” (page 54)
Battery	DIONIC HD*2 HYTRON140*2	“Mounting and setting battery” (page 27)
expressP2 memory card	AU-XP0256AG	“P2 card” (page 36)
SD memory card*3 P2 memory card*3 microP2 memory card*3	Visit the support desk at the website*3	“P2 card” (page 36)

*1 The camera module and recording module are both required in this system. The system will not run with only one of those modules.

*2 A battery holder is provided as standard on the recording module.

*3 Refer to our support desk at the following website for the latest information not included in this document.
http://pro-av.panasonic.net/

Expansion system devices

You can also use the following devices in addition to the basic system devices.

Part name	Part No.	Remark
4K LCD monitor	BT-4LH310	—
LCD monitor	BT-LH910G, etc.	—
Memory card drive	AU-XPD1	—
External DC power supply	—	“Using external DC power supply” (page 28)
VARICAM HS camera module	AU-V23HS1G	—

Accessories

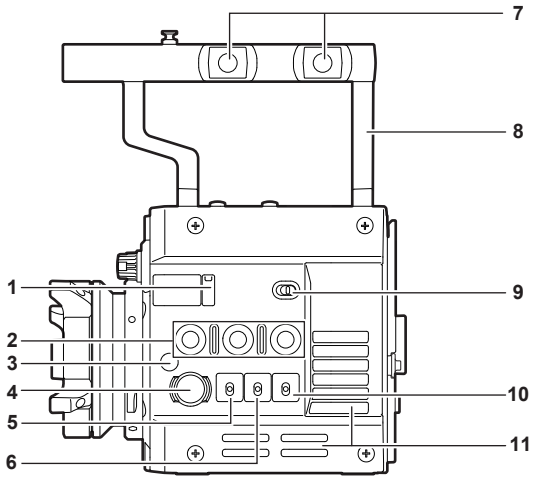
Product name	Model No.	Remark
Tripod adaptor	SHAN-TM700	“Attaching a tripod” (page 25)
Soft carrying case	AJ-SC900	—
Rain cover	SHAN-RC700	“Attaching the rain cover” (page 26)
Microphone holder	AJ-MH800G	“Using front microphone” (page 54)

Chapter 2 Description of Parts

This chapter describes the names, functions, and operations of parts on the camera.

Camera module

Left side



1 Lens flange back adjustment hole
Used when adjusting the lens flange back.

2 USER buttons (<1>/<2>/<3>)
User-selected functions can be assigned to each button. Pressing a button performs the assigned function.

3 Focus hook/focus mark <ϕ>
Indicate the focal plane of the MOS sensor.

4 <REC> button
Press this button to start recording. Press this button again to stop recording. The button lights up in red during recording.

5 <SHUTTER> switch
Switch for changing the electronic shutter.

6 <EI> switch
Switch for changing the EXPOSURE INDEX (gain).

7 Accessory mounting holes
For attaching accessories.
- Mounting hole size
  - 3/8-16 UNC

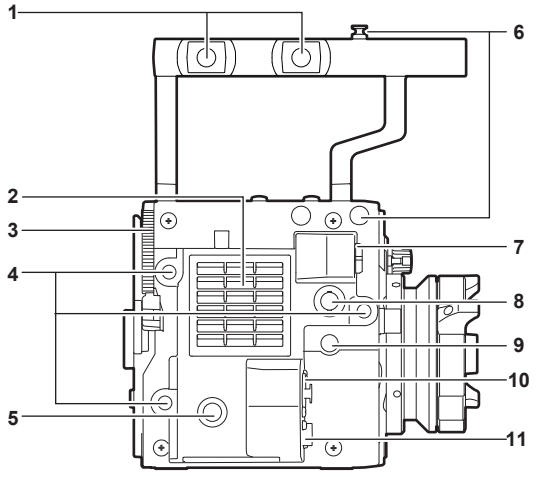
8 Handle

9 <LOCK> switch
Disables the operation of the camera module buttons and switches. (except the <REC> button)
Keep this in the <LOCK> position to prevent incorrect operation when moving the camera, etc.

10 <WB> switch
Switch for changing the white balance.

11 Fan inlet
Fan inlet for dissipating heat. Do not block this when the camera is in use.

Right side



1 Accessory mounting holes
For attaching accessories.
- Mounting hole size

- 3/8-16 UNC

2 Fan outlet
Fan outlet for dissipating heat. Do not block this when the camera is in use.

3 Recording module release lever
Lever for removing the recording module (optional) from the camera module.

4 Accessory mounting holes
For attaching accessories.
- Mounting hole size
  - 1/4-20 UNC (screw length 5.5 mm or shorter)

5 USER button (<4>)
User-selected functions can be assigned to this button. Pressing the button performs the assigned function.

6 Focus hook
Indicate the focal plane of the MOS sensor. It provides a reference for measuring the accurate focal length from the subject.

7 <VF> terminal
Terminal for connecting the HD viewfinder AU-VCVF1G (optional).

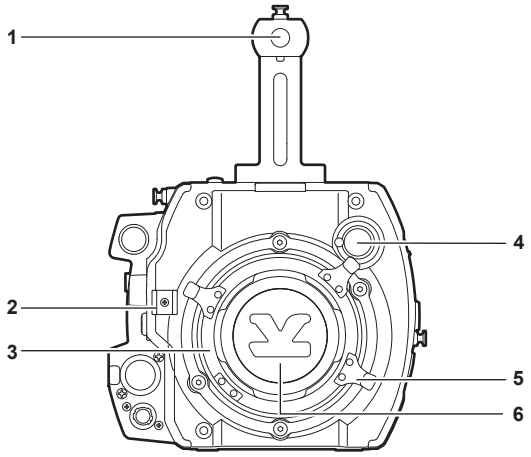
8 <VF SDI> terminal
Output terminal for 3G/HD SDI. Displays the video equal to the viewfinder display.
For the cable to connect to this terminal, prepare a double-shielded cable equivalent to 5C-FB.

9 <DC OUT> terminal
This is the DC12 V output terminal. It provides a maximum current of 1 A.

10 <MIC IN> terminal
Terminal for connecting a microphone.

11 <LENS> terminal
Terminal for connecting a lens cable. For details, refer to the Operating Instructions for the lens.

Front



1 Accessory mounting holes
For attaching accessories.
- Mounting hole size
  - 3/8-16 UNC (screw length 5.5 mm or shorter)

2 Lens cable /microphone cable clamp
Clamp for securing the lens and microphone cables.

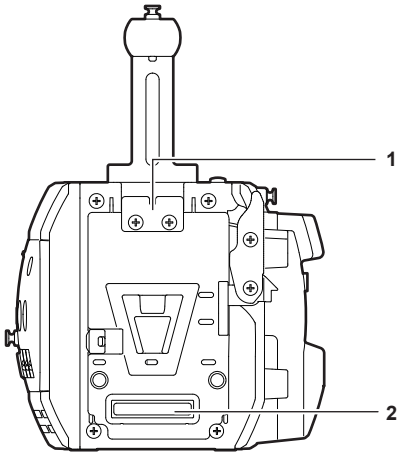
3 Lens mount
Holds the lens.

4 <FILTER> dial
Selects a filter which suits the illumination of the subject.
<1><CLEAR>: Does not use the ND filter.
<2><0.6ND>: Reduces the amount of light entering the MOS sensor to 1/4.
<3><1.2ND>: Reduces the amount of light entering the MOS sensor to 1/16.
<4><1.8ND>: Reduces the amount of light entering the MOS sensor to 1/64.

5 Lens lever
After mounting the lens to the lens mount, tighten the lever to secure the lens.

6 Mount cap
Attach the cap when the lens is not mounted.

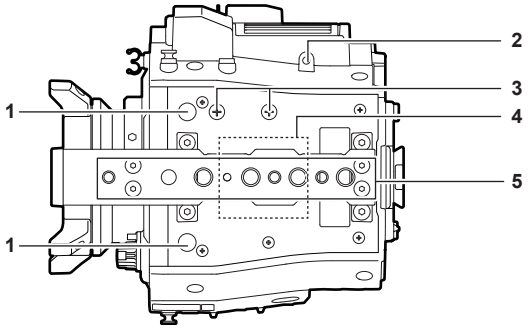
Rear



1 Lock plate
Fitting which secures the recording module in place when connected.

2 Recording module connection terminal
Terminal for connecting the recording module.

Top



1 Viewfinder mounting holes
For attaching the viewfinder.

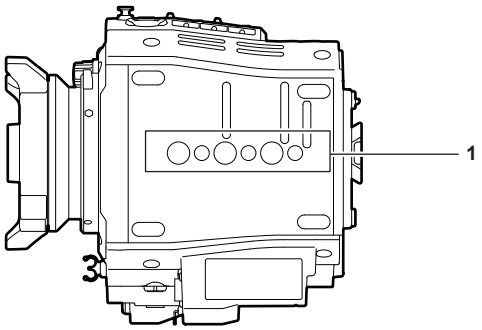
2 Mounting hole for control panel mounting part

3 Microphone holder mounting position

4 GPS module position
This part has a built-in GPS module. Do not cover this part with metallic objects when the GPS is in use.

5 Accessory mounting holes
For attaching accessories.
- Mounting hole size
  - 1/4-20 UNC
  - 3/8-16 UNC

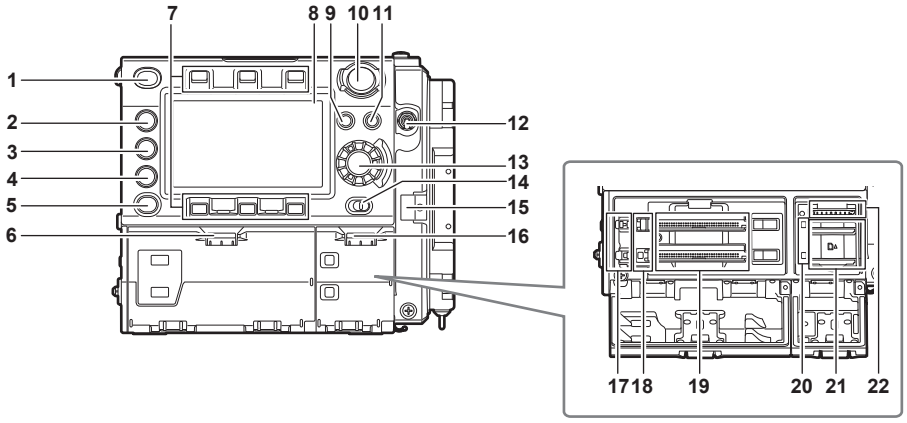
Bottom



1 Shoulder mount module/tripod mounting holes
For attaching the shoulder mount module or a tripod.
- Mounting hole size
  - 1/4-20 UNC (screw length 5.5 mm or shorter)
  - 3/8-16 UNC (screw length 5.5 mm or shorter)

Recording module

Left side



1 <HOME> button
Returns to the HOME screen when pressed.

2 <PLAY> button
Shows the PLAY screen when pressed.

3 <TC> button
Shows the TC screen when pressed.

4 <INFO> button
Shows the INFO screen when pressed.

5 <VIEW> button
Displays the camera video in the control panel.

6 Main slot open/close switch
Opens the main slot bay.

7 Control panel operation buttons
Buttons for operating the control panel. User-selected functions can be assigned to each button to function as USER buttons.

8 Control panel
Used to perform tasks such as checking the device status and setting basic items.

9 <MENU> button
Displays the setting menu in the control panel screen.

10 <REC> button
Press this button to start recording. Press this button again to stop recording. The button lights up in red during recording.

11 <EXIT> button
Restores the display to the previous state while the setting menu or control panel operation is displayed.

12 <POWER> switch
Switch on/off the power.
Even when the <POWER> switch is set to the <OFF> position, the camera is not shut off from the main power.

13 Jog dial button
Used for setting, moving items, and selecting menus on the control panel.

14 <LOCK> switch
Disables the operation of the control panel buttons and switches. (except the <REC> button)
Keep this in the <LOCK> position to prevent incorrect operation when moving the camera, etc.

15 Cable clamp
Clamp for securing the control panel extension unit cable.

16 Open/close switch for sub slot and SD memory card slot
Opens the sub slot / SD memory card slot bay.

17 Main slot lock switch 1/2
Lock switch to prevent incorrect insertion and removal in the main slot.
Recording is enabled when this is locked.
Do not release the lock during recording.

18 Main slot 1/2 access LED
Indicates the access status of recording and playback of each card inserted in main slot 1/2.

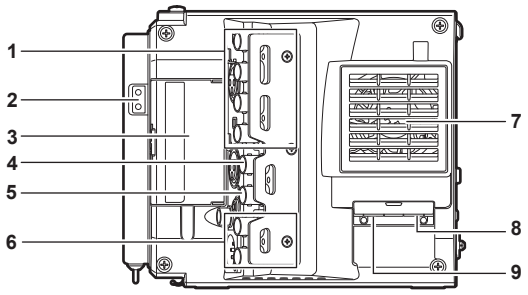
19 Main slot 1/2
Slot for expressP2 memory cards.

20 Sub slot 3/4 access LED
Indicates the access status of recording and playback of each card inserted in sub slot 3/4.

21 Sub slot 3/4
Slot for microP2 memory cards.

22 SD memory card slot
Slot for SD memory cards (optional). SD memory cards are used for opening the camera setting menu, recording/opening lens files, or uploading metadata.

Right side



1 <SDI OUT1>/<SDI OUT2>/<SDI OUT3>/<SDI OUT4> terminal
Output terminal for 3G/HD SDI. This terminal outputs videos in SINGLE, DUAL, or QUAD mode.
For the cable to connect to this terminal, prepare a double-shielded cable equivalent to 5C-FB.

2 Light output terminal
Power supply terminal when light is connected.

3 <USB HOST> terminal (inside the cover, 5.0 V 0.5 A max)
For mounting the wireless module AJ-WM30 (optional). (Will be supported)
For the cable to connect to this terminal, prepare a double-shielded cable.

4 <TC IN/OUT> terminal
Connects to the time code input terminal of the external device when locking the time code of the external device to the time code on the camera.
For the cable to connect to this terminal, prepare a double-shielded cable equivalent to 5C-FB.

5 <GENLOCK IN> terminal
Inputs reference signals when setting the genlock on the camera unit or when externally locking the time code. The input signal is 3G/HD-SDI.
For the cable to connect to this terminal, prepare a double-shielded cable equivalent to 5C-FB.

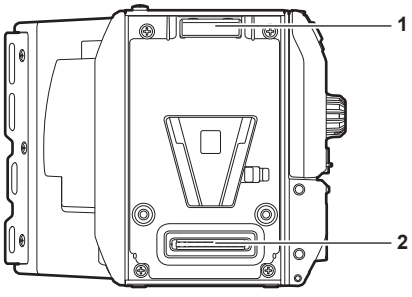
6 <MON OUT1>/<MON OUT2> terminal
3G/HD-SDI output terminal of videos for the monitor.
For the cable to connect to this terminal, prepare a double-shielded cable equivalent to 5C-FB.

7 Fan outlet
Fan outlet for dissipating heat. Do not block this when the camera is in use.

8 <USB DEVICE> terminal
USB device terminal for connecting a USB 2.0 cable.
For the cable to connect to this terminal, prepare a double-shielded cable.

9 <LAN> terminal
For connecting a LAN (100BASE-TX) cable. (Will be supported)
For the cable to connect to this terminal, prepare a shielded cable.

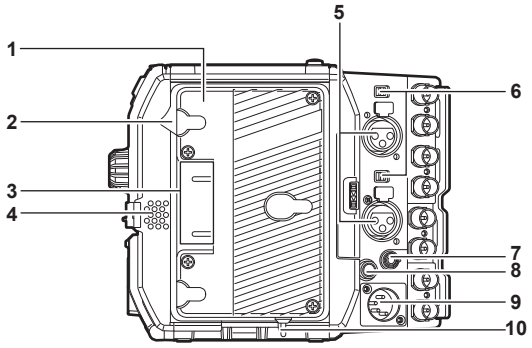
Front



1 Lock angle
Fitting which secures the camera unit (optional) in place when connected.

2 Camera unit connection terminal
Terminal for connecting the camera unit (optional).

Rear



1 Battery holder
For mounting Anton/Bauer batteries.

2 Battery release lever
Pull this battery release lever down to release the battery.

3 Battery contact terminals
Contact terminals for the battery.

4 Speaker
EE audio can be monitored during recording while playback audio can be monitored during playback.
The alarm is output in sync with flashing/lighting of the warning indicator.
Audio from the speaker automatically is turned off when headphones are connected to the <PHONES> terminal.

5 <AUDIO IN 1>/<AUDIO IN 2> terminal
Connect the audio equipment or the microphone.

6 <LINE>/<MIC> switch
Switch for switching audio input signals connected to the <AUDIO IN 1>/<AUDIO IN 2> terminal.
<LINE>: Select when audio equipment is connected by the line input.
<MIC>: Select when a microphone is connected.

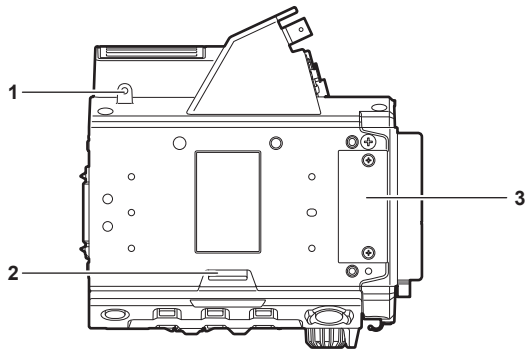
7 <PHONES> terminal
Connecting terminal of headphones for audio monitor. (Stereo mini jack)

8 <DC OUT/RS> terminal
Terminal for DC 12 V output and REC trigger input. The DC output provides a maximum current of 1.0 A.

9 <DC IN> terminal
Input terminal for connecting an external DC power supply.

10 <LIGHT CONTROL> switch
Control switch when light is connected to the light output terminal.

Top side

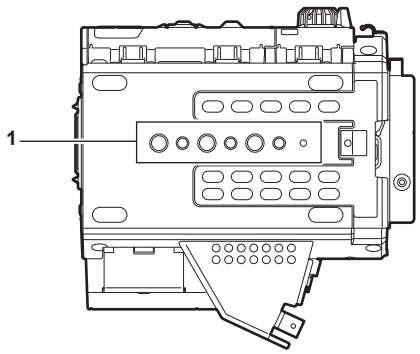


1 Mounting hole for control panel mounting part

2 <RELEASE> switch
Switch for removing the control panel.

3 External unit connection terminal
Terminal for future expansions. Keep the cover on during normal use.

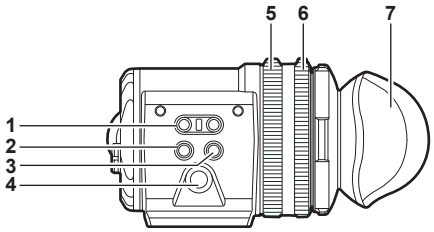
Bottom



1 Shoulder mount module/tripod mounting holes
For attaching the shoulder mount module or a tripod.
- Mounting hole size
  - 1/4-20 UNC (screw length 5.5 mm or shorter)
  - 3/8-16 UNC (screw length 5.5 mm or shorter)

Electronic HD color viewfinder

Left side



1 <EVF USER 1>/<EVF USER 2> buttons
User-selected functions can be assigned to each button. Pressing a button performs the assigned function. Functions are set on the viewfinder menu.

2 <CAM MENU> button
Displays the camera menu screen.

3 <EVF MENU> button
Displays the viewfinder menu screen.

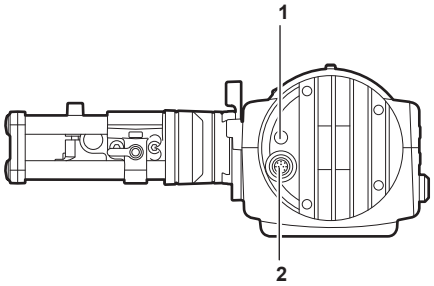
4 Jog dial
Operation dial.
Used for setting, moving, and selecting in menus.

5 Zoom ring
Ring which enlarges/reduces the size of the viewfinder display screen.
This is used to enlarge the display when adjusting the focus. When the display is enlarged, some parts of the video may be hidden.

6 Visibility adjustment ring
Ring which adjusts the visibility. Turn this ring while pressing and holding the upper button.

7 Eye cup

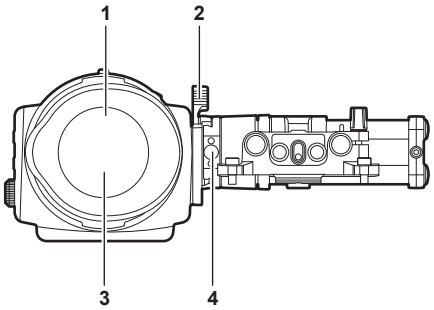
Front



1 Tally LED
Lights up in red during recording. This can be disabled in the viewfinder menu.

2 Connection terminal
Terminal for connecting the supplied cable. This connects to the camera module (optional).

Rear



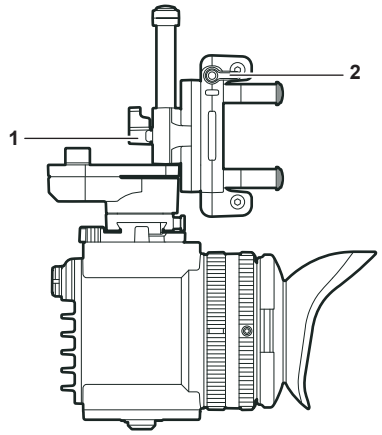
1 Eye sensor
Screen is displayed on the viewfinder when an eye is brought close.
The eye sensor may not work properly depending on the shape of glasses in use, how you hold the camera, or the strong light hitting around the eye piece.

2 Lock lever
Secures the viewfinder in place.

3 Eye piece filter
Protective filter against dust, water, and moisture. Use the camera with this attached.

4 Stopper
Used when removing the viewfinder from the slider unit.

Top

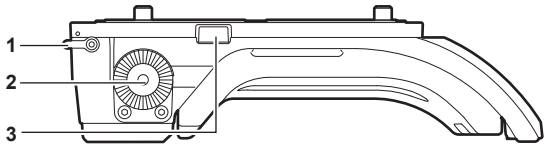


1 Lock lever (left/right position)
Adjusts the position of the viewfinder (left/right).

2 Lock lever (front/back position)
Adjusts the position of the viewfinder (front/back).

Shoulder mount module

Left side

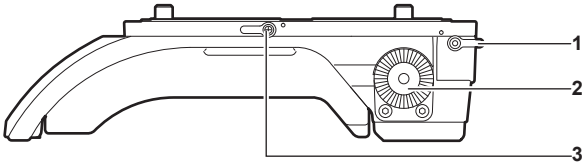


1 Support rod lock knob
Secures the rod in place.
: Release, : Lock

2 Accessory attachment (rosette)
Attach accessories such as hand grip.
- Mounting screw size
  - M6 (screw length 9 mm or shorter)

3 Stopper
Pressed when removing the slide rail from the shoulder mount module.

Right side

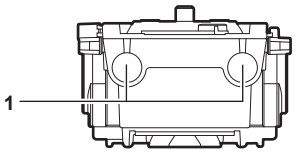


1 Support rod lock knob
Secures the rod in place.
: Release, : Lock

2 Accessory attachment (rosette)
Attach accessories such as hand grip.
- Mounting screw size
  - M6 (screw length 9 mm or shorter)

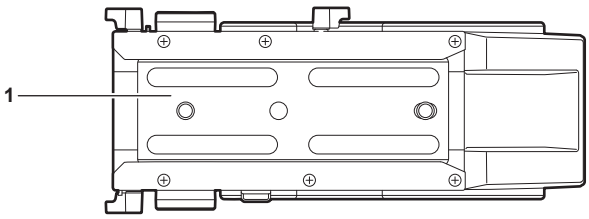
3 Slide rail lock knob
Secures the slide rail in place.

Front



1 Support rod mounting holes
Holes for connecting a rod with a diameter of 15 mm.

Top



1 Slide rail
Attaches to the camera.

Chapter 3 Preparation

Before you use the camera, assemble the unit following the procedures in this chapter. The mounting of accessories is also described in this chapter.

Assembling modules

Assembling the camera module and recording module

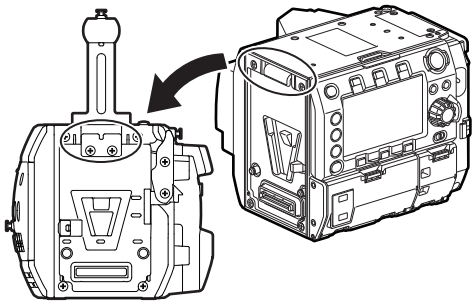


Fig. 1

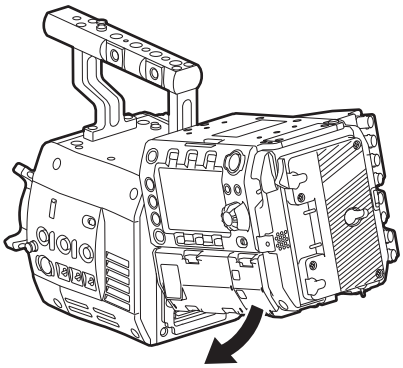


Fig. 2

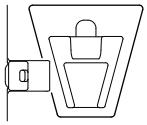


Fig. 3

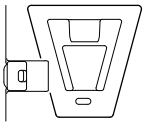


Fig. 4

1 Align the upper lock angle in front of the recording module with the upper lock plate at the rear of the camera module. (Fig. 1)

2 Firmly push in the recording module and connect the connection terminals of the camera module and recording module. (Fig. 2)

NOTE

- The modules cannot be joined together if the V edge of the camera module is down. (Fig. 3) Push down the recording module release lever of the camera module to raise the V edge. (Fig. 4)
- Do not touch the mechanical parts near the V edge. The V edge will move quickly, which may cause injury.

Disassembling

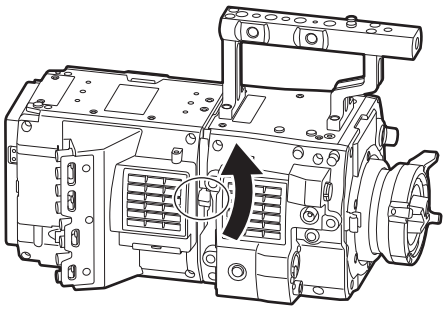


Fig. 1

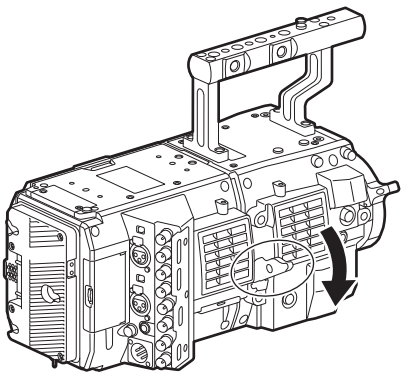


Fig. 2

1 Push down the recording module release lever (Fig. 2) while pulling up the lock knob (red) of the recording module release lever (Fig. 1).

The rear part of the recording module will slightly come up.
It will be difficult for the rear part to come up when heavy items such as batteries are mounted.

2 Lift the recording module.

Do not hold the control panel part. Doing so may cause the control panel to detach and fall.

3 Remove the upper lock angle in front of the recording module from the upper lock plate at the rear of the camera module.

Mounting the Electronic HD color viewfinder

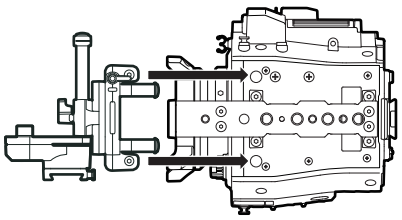


Fig. 1

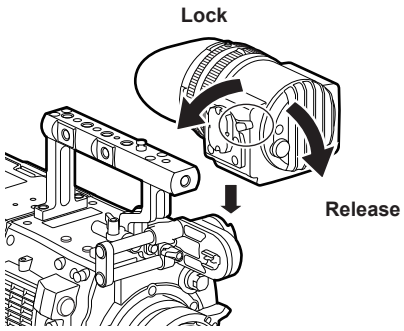


Fig. 2

1 Attach the slider unit to the viewfinder mounting holes on top of the camera module using the two supplied screws. (Fig. 1)

2 Slide the viewfinder plate from above into the slider unit. (Fig. 2)

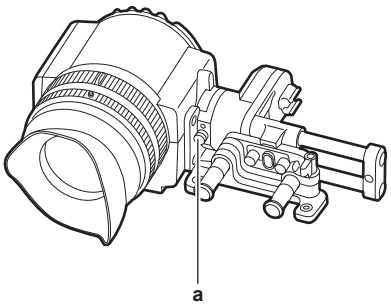
Release the viewfinder lock lever by pushing it forward.

3 Push down the lock lever backwards to lock.

4 Connect the supplied connecting cable to the viewfinder connection terminal and the camera module's <VF> terminal.

Connect by aligning the red mark on the connector.

Disassembling



a: Stopper

1 Remove the connecting cable.

2 Push down the lock lever towards the front to release the lock.

3 Lift the viewfinder while pulling the stopper.

4 Remove the slider unit clamping screw.

Mounting the shoulder mount module

Mount the shoulder mount module after mounting the camera module and recording module.

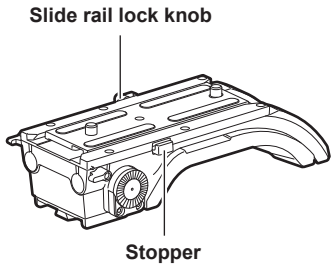


Fig. 1

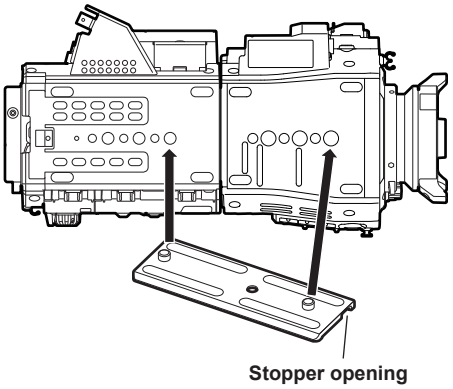


Fig. 2

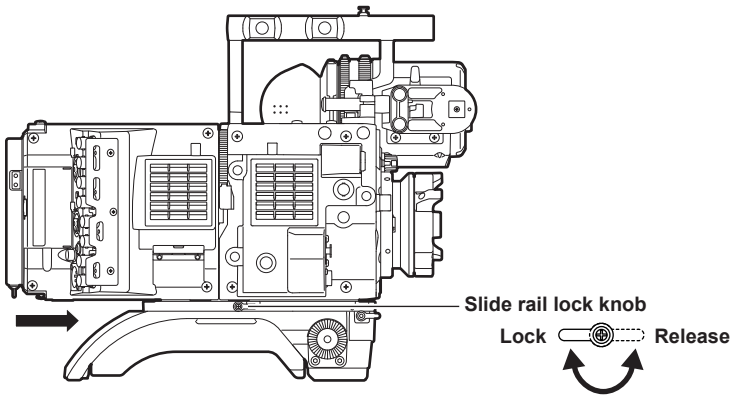


Fig. 3

1 Release the slide rail lock knob.

2 Remove the slide rail from the shoulder mount module while pressing the stopper. (Fig. 1)

3 Orient the stopper opening of the slide rail toward the front of the camera, and securely mount to the bottom of the camera with the supplied two screws on the screw holes indicated in the figure. (Fig. 2)

4 Slide the camera forward along the groove in the shoulder mount module from the rear until it clicks. (Fig. 3)

Before mounting, confirm that the slide rail lock knob is released.

5 After adjusting the slide position of the camera considering its weight balance, lock by turning the slide rail lock knob clockwise.

Confirm that the camera is securely locked. The camera may fall causing a malfunction or injury when the camera is off balance or the screws are not locked securely.

Disassembling

1 Release the slide rail lock knob.

2 Remove the camera from the shoulder mount module by sliding it toward rear while pressing the stopper.

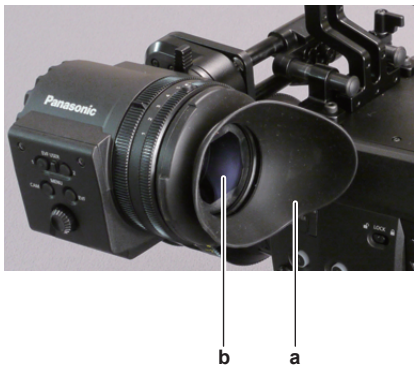
3 Loosen the two screws and remove the slide rail from the bottom of the camera.

If the shoulder mount is mounted on a tripod, lock the pan lock lever and the tilt lock lever of the tripod. It may lose balance and fall, causing a malfunction or injury.

Attaching and removing accessories

Eye cup/eye piece filter

The eye cup and eye piece filter can be removed. Always use the camera with these attached.



a: Eye cup

b: Eye piece filter

Attaching a tripod

When mounting the camera on a tripod, use the optional tripod adaptor (SHAN-TM700).

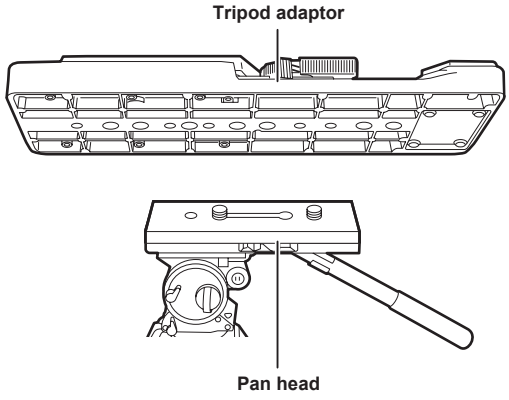


Fig. 1

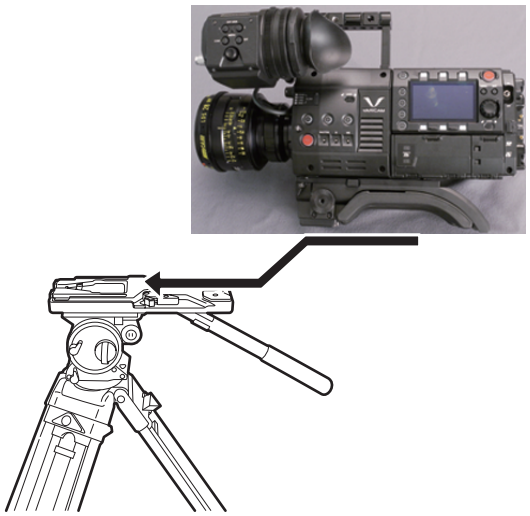


Fig. 2

1 Mount the tripod adaptor on the tripod. (Fig. 1)

2 Mount the camera on the tripod adaptor. (Fig. 2)

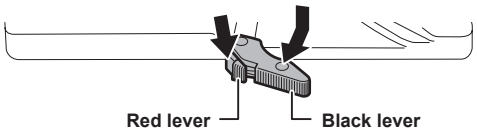
Slide the camera forward along the grooves until you hear a click.

NOTE

- Select an appropriate hole in the adaptor, taking into account the center of gravity of the camera and tripod adaptor combined. Also, make sure that the diameter of the selected hole matches the diameter of the pan head screw.

Removing the camera from the tripod adaptor

While holding the red lever down, move the black lever in the direction of the arrow, and slide the camera backward to remove it.

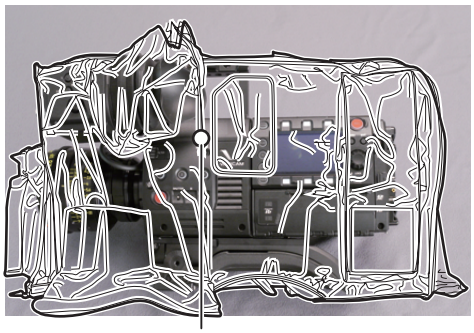


NOTE

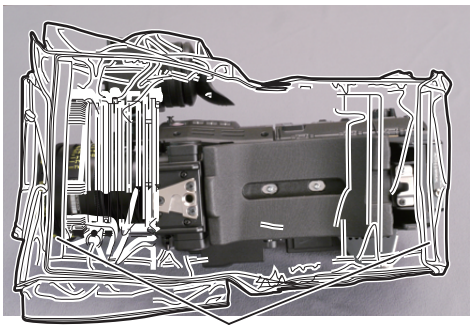
- If the tripod adaptor pin does not return to its original position after the camera has been removed, hold the red lever down and move the black lever in the direction of the arrow again, in order to return the pin to its original position. The camera cannot be mounted if the pin remains in the center. Be careful.

Attaching the rain cover

The figure below shows an example of use of the rain cover SHAN-RC700 (optional).



Tighten the cord



Secure with the surface fastener

Power supply

A battery or an external DC power supply can be used as the power supply.

Using batteries

Connection of the following batteries to the camera has been verified.

■ **Anton/Bauer batteries**

HYTRON140
DIONIC HC/DIONIC HCX/DIONIC HD

■ **IDX batteries**

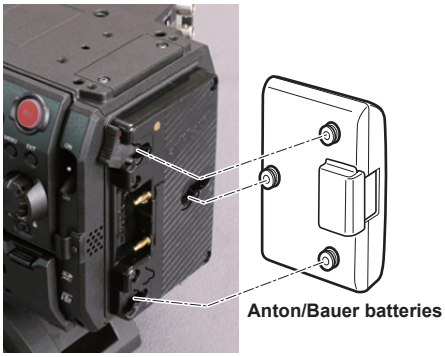
ENDURA HL9

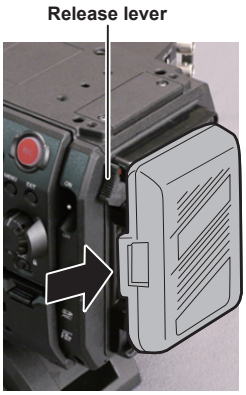
NOTE

- Other batteries can be supported by changing [BATTERY SELECT] in [MENU] → [SYSTEM SETTINGS] → [BATTERY]. Use of batteries that are already verified as connectable to the camera is recommended.
- Before you use a battery, charge it with a battery charger. (For details on charging, refer to each operating instructions.)

Mounting and setting battery

Using Anton/Bauer batteries





1 Mount the Anton/Bauer battery.

2 Insert the battery terminal and slide in the direction of the arrow.

3 Set the battery type.

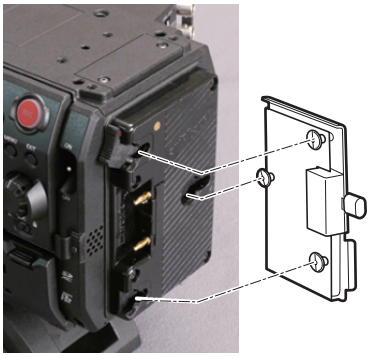
From [MENU] → [SYSTEM SETTINGS] → [BATTERY] → [BATTERY SELECT], select the battery type.
For details, refer to “Setting menu basic operations” (page 83).

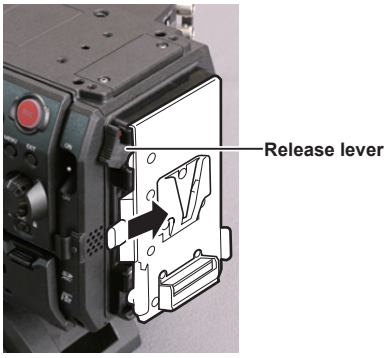
NOTE

- To remove the battery, keep the release lever of the battery holder completely down, slide the battery in the opposite direction when you mounted it.

Using V-mount type batteries

Mount the V-mount type battery plate. As shown in the illustration, insert and slide in the direction of the arrow.





1 Mount the V-mount type battery plate.

2 Slide in the direction of the arrow.

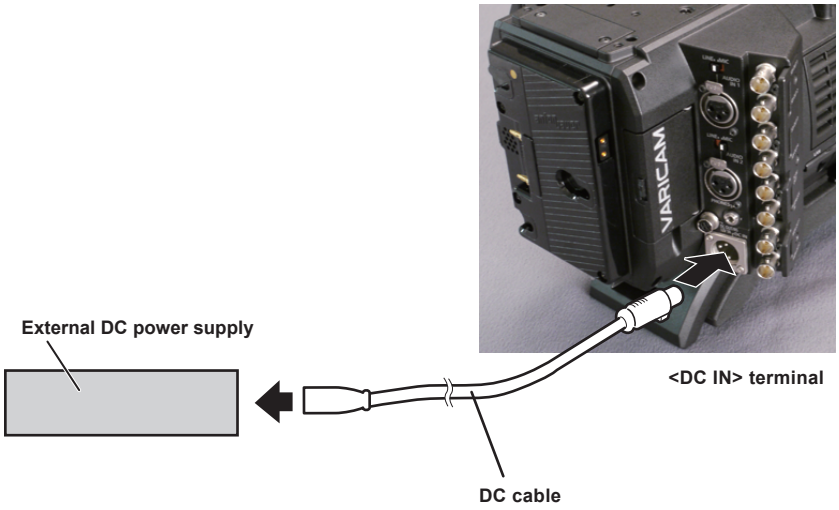
3 Set the battery type.

- From [MENU] → [SYSTEM SETTINGS] → [BATTERY] → [BATTERY SELECT], select the battery type.

NOTE

- Contact your dealer for information about the V-mount type battery plate.
- When the V-mount type battery plate is used, % (percent) is not displayed even if batteries with a battery level indicator function are used.
- When removing the plate, remove by sliding the release lever.
- When using a battery that is not included in [BATTERY SELECT], set [other], then set [FULL Volt], [NEAR END Volt], or [END Volt] according to the characteristics of the battery.

Using external DC power supply



1 Connect the external DC power supply to the <DC IN> terminal of the camera.

2 Turn on the power switch of the external DC power supply (if the external DC power supply has a power switch).

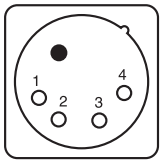
3 Turn the <POWER> switch of the camera to <ON>.

■ External DC power supply

Connect after making sure that the output voltage of the external DC power supply is compatible with the rated voltage of the camera.
Select an output amperage for the external DC power supply with a margin above the total amperage of the connected devices.
The total amperage of connected devices can be calculated with the following formula.
Total power consumption ÷ Voltage
When the power of the camera is turned on, inrush current is generated. Insufficient power supply when turning on the power may cause a malfunction. We recommend that you use an external DC power supply that can assure double the capacity of the total power consumption of the camera and connected devices that are turned on by interlock when the power of the camera is turned on (such as lenses). For the DC cable, use a dual-core shielded wire of AWG16 (nominal cross section area 1.309 mm^2) or thicker.

- Make sure of the pin alignment of the DC output terminal of the external DC power supply and the camera <DC IN> terminal, and connect the polarity correctly.
  If the +12 V power supply is mistakenly connected to the GND terminal, it may cause fire or malfunction.

DC IN



1	GND
2	NC
3	NC
4	+12 V

Panasonic Parts No.: K1AA104H0038
Manufacturer Parts No.: HA16RX-4P (SW1) (76) (Hirose Electric Co.)

NOTE

- When both the battery and the external DC power supply are connected, the power supply from the external DC power supply has priority. The battery may be removed while using the external DC power supply.
- When using an external DC power supply, always turn the power switch of the external DC power supply on before turning the <POWER> switch of the camera <ON>. If the operations are performed in reverse, the camera may malfunction because the external DC power supply output voltage rises too slowly.
- When switching the power supply from an external DC power supply to the battery, carefully remove the DC cable from the <DC IN> terminal. Removing the cable quickly may temporarily stop the camera's operation.
- When power is supplied from the <DC IN> terminal, the light circuit does not function. The light circuit can be used only when power is supplied from the Anton/Bauer battery plate.
- When a battery is connected to the <DC IN> terminal, set [MENU] → [SYSTEM SETTINGS] → [BATTERY] → [EXT DC IN SELECT] to [BATTERY], then set [FULL Volt], [NEAR END Volt], or [END Volt] according to the characteristics of the battery. However, in this the case, the percent (%) display will not be available for batteries with a battery level indicator function.

Mounting and adjusting the lens

Mounting the lens

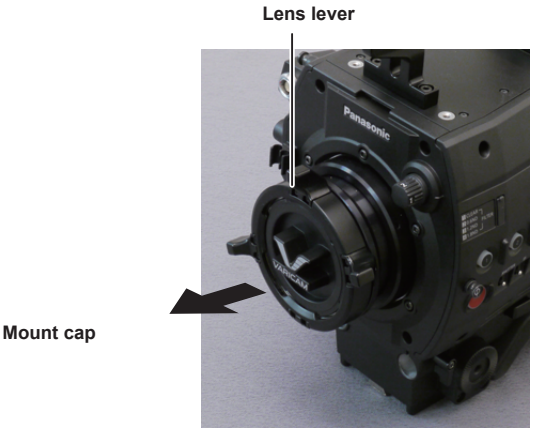


Fig. 1

Fig. 2

Fig. 3

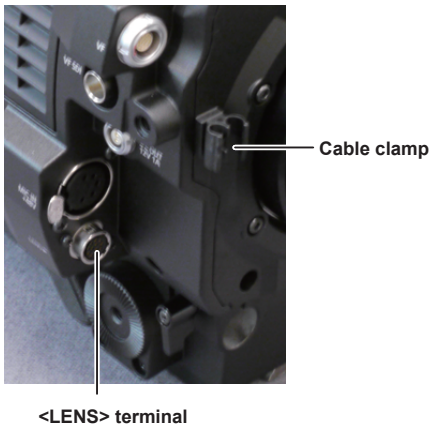


Fig. 4

1 **Raise the lens lever and remove the mount cap. (Fig. 1)**

2 **Align the convex portion at the upper right of the lens mount with the concave portion at the lens mount to mount the lens. (Fig. 2)**

3 **Lower the lens lever to firmly clamp the lens. (Fig. 3)**

4 **If a cable is attached to the lens, secure the cable through the cable clamp and connect it to the <LENS> terminal. (Fig. 4)**

NOTE

- For handling the lens, refer to the lens operating instructions.
- When the lens is removed, install the mount cap to protect the device.

Flange lens back adjustment

The camera is equipped with the adjustment function of the flange back (distance from the lens mounting surface to the image formation surface). As the factory setting, it is adjusted with high accuracy. If you adjust the flange back, perform the adjustment in an well-equipped environment.

NOTE

- Contact your dealer for information about the adjustment method.

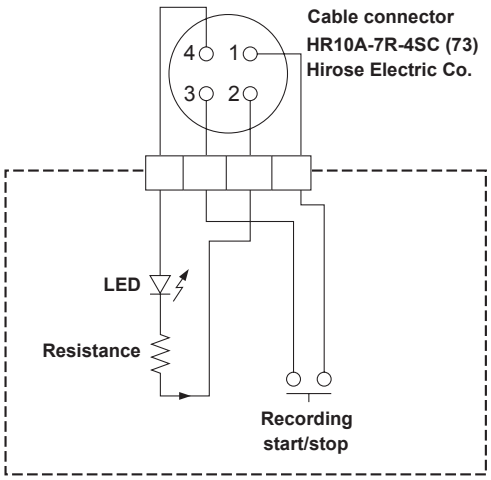
Connecting to the DC output terminal

Connecting the <DC OUT/RS> terminal to the external recording start/stop switch

It is possible to get a 1.0 A current from the <DC OUT/RS> terminal of the recording module.
Recording start/stop can be controlled by connecting an external switch to this terminal.
An LED connected to this terminal can also be used as a tally lamp. This is useful for shooting video when fixing the camera on a crane.

<DC OUT/RS> terminal

(Connection example)



1 GND

2 TALLY OUT
Open collector output on the camera side

Tally lamp on	Low impedance
Tally lamp off	High impedance

3 Recording start/stop switch
This is connected in parallel to the <REC> button on the camera or the VTR button on the lens.

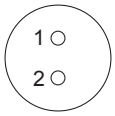
4 +12 V

NOTE

- Make sure that polarity is correct before connecting an external device. Otherwise, it may result in a malfunction.

Connecting to the <DC OUT> terminal

It is possible to get a 1.0 A current from the <DC OUT> terminal of the camera module.



Cable connector
0B.302
LEMO

1 GND

2 +12 V

NOTE

- Make sure that polarity is correct before connecting an external device. Otherwise, it may result in a malfunction.

Setting the date/time of the internal clock

The value of the time is recorded to content (clips) and affects the thumbnail playback order. Before recording, be sure to check and set the date and time zone.

1 Press the <MENU> button.

- The [MENU] screen is displayed on the control panel.

2 Select [MENU] → [SYSTEM SETTINGS] → [CLOCK] → [CLOCK SETTING] to set the year, month, day, and time.

The year setting upper limit is 2037. For details on the settings menu, refer to “Setting menu basic operations” (page 83).

3 Select [MENU] → [SYSTEM SETTINGS] → [CLOCK] → [TIME ZONE] to set the time difference from Greenwich Mean Time.

The time zones are always recorded as metadata together with date/time.

NOTE

- You can correct the date and time of the internal clock from GPS by enabling the GPS function.

■ Time zone table

Time difference	Region	Time difference	Region
00:00	Greenwich	+01:00	Central Europe
−00:30		+01:30	
−01:00	Azores	+02:00	Eastern Europe
−01:30		+02:30	
−02:00	Mid-Atlantic	+03:00	Moscow
−02:30		+03:30	Tehran
−03:00	Buenos Aires	+04:00	Abu Dhabi
−03:30	Newfoundland	+04:30	Kabul
−04:00	Halifax	+05:00	Islamabad
−04:30		+05:30	Bombay
−05:00	New York	+06:00	Dakar
−05:30		+06:30	Yangon
−06:00	Chicago	+07:00	Bangkok
−06:30		+07:30	
−07:00	Denver	+08:00	Beijing
−07:30		+08:30	
−08:00	Los Angeles	+09:00	Tokyo
−08:30		+09:30	Darwin
−09:00	Alaska	+10:00	Guam
−09:30	Marquesas Islands	+10:30	Lord Howe Island
−10:00	Hawaii	+11:00	Solomon Islands
−10:30		+11:30	Norfolk Island
−11:00	Midway Islands	+12:00	New Zealand
−11:30		+12:45	Chatham Islands
−12:00	Kwajalein Atoll	+13:00	
+00:30			

NOTE

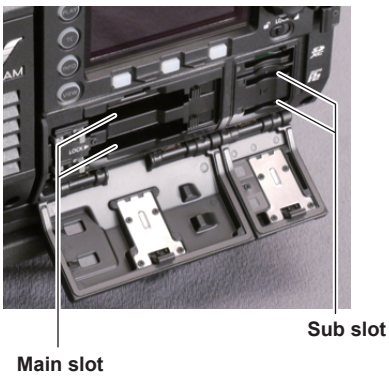
- Be sure to make this setting before using the camera for the first time. After, do not change the setting during use.
- Clock accuracy is a lunar inequality of approximately ±30 seconds with the power off. When accurate time is required, check and reset the time when the power is turned on.
  Note that if the time is received using the built-in GPS, the time of the internal clock (local date and time) is maintained accurately based on the time received (Greenwich mean time) and the time zone.
  If the time display of the internal clock is different from the local time, the time zone setting may be incorrect. Check the time zone setting again (internal clock does not need to be set again).
- The internal clock runs for several years on the built-in lithium cell of the camera. When the lithium cell runs out of power, [BACKUP BATT EMPTY] will be displayed in the viewfinder when the camera is turned on. For details, refer to “Maintenance” (page 107).

Chapter 4 Video Recording and Color Grading

This chapter describes the video combinations that can be recorded and the color grading (in-camera color grading) that can be performed using the camera.

Dual-recording

The camera has two built-in recorders.



■ Main recorder

Card slot	expressP2 memory card slot × 2
Compatible memory cards	expressP2 memory card P2 memory card (with some restrictions)

- P2 memory cards cannot be used when the 4K format or the variable frame rate function is enabled.
- P2 memory cards of 2 GB cannot be used.
- R, A, and E series P2 memory cards cannot be used for 1080/59.94P and 1080/50P.

■ Sub recorder

Card slot	microP2 memory card slot × 2
Compatible memory cards	microP2 memory card

- Proxy data can be recorded simultaneously in the sub recorder (with some restrictions)
- Videos with a variable frame rate cannot be recorded using the sub recorder.
- Recording using only the sub recorder is not possible.

Selecting the resolution, codec, and video format for recording

You can select the recording resolution, recording codec, and recording frame rate.

- [PIXEL]: Resolution
- [MAIN CODEC]: Recording format
- [FREQUENCY]: System frequency
- VFR: Variable frame rate function (maximum frame rate)
- [SUB CODEC]: Sub recording format
- [PROXY]: Proxy data recording (Proxy data recording does not function when the variable frame rate function is enabled.)

[PIXEL]	[MAIN CODEC]	[FREQUENCY]	VFR (maximum frame rate)	[SUB CODEC]	[PROXY]
[4096×2160]	[AVC-Intra4K 422]	[23.98p]	60fps	[AVC-Intra2K 422]	[G3.5(1024×540)]
		[25.00p]	50fps		
		[29.97p]	60fps		
		[50.00p]	50fps	[AVC-Intra2K 422]	—
		[59.94p]	60fps		
[3840×2160]	[AVC-Intra4K 422]	[23.98p]	60fps	[AVC-Intra100] [AVC-LongG50] [AVC-LongG25]	[G3.5(960×540)]
		[25.00p]	50fps		
		[29.97p]	60fps		
		[50.00p]	50fps	[AVC-Intra100] [AVC-LongG25]	—
		[59.94p]	60fps		
[1920×1080]	[AVC-Intra100]	[23.98p]	60fps	[AVC-Intra100] [AVC-LongG50] [AVC-LongG25]	[G3.5(960×540)]
		[25.00p]	50fps		
		[29.97p]	60fps		
		[50.00p]	50fps	[AVC-Intra100] [AVC-LongG25]	—
		[59.94p]	60fps		

Recording format

- OP-1b format: [AVC-Intra4K 422]/[AVC-Intra2K 422]/[AVC-LongG50]/[AVC-LongG25]
- OP-Atom format: [AVC-Intra100]

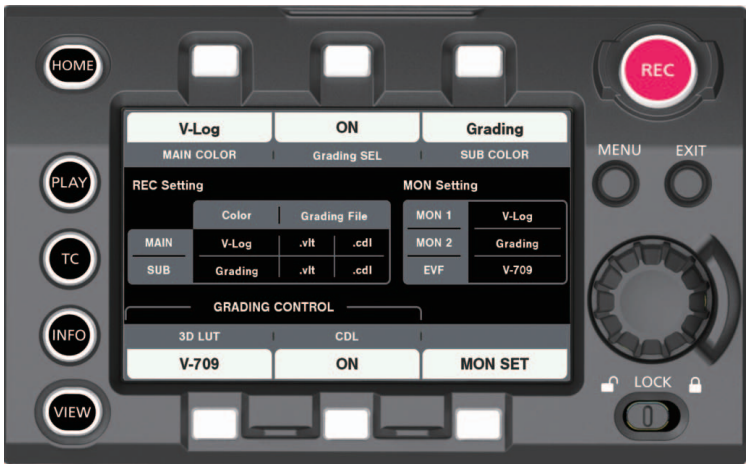
NOTE

- Operation mode of the image sensor and signal processing will change depending on selection of [MAIN CODEC].

In-camera grading

This chapter describes the camera's grading function. You can record V-Log (master video) in the main recorder and grading video in the sub recorder simultaneously.

Grading function



[CDL]:

- Controlled using [Slope], [Offset], [Power] (RGB stand-alone), and [Saturation] (RGB common).
- Can be controlled in real-time using the camera's control panel.
- Control parameters are saved to a file and stored in a P2 card together with videos, etc.
- The file extension is .cdl.

[3D LUT]:

- Controlled in a 17-grid [3D LUT] file.
- Uploads data within the camera through an SD memory card.
- Control parameters are saved to a file and stored in a P2 card together with videos, etc.
- The file extension is .vlt.

Control combinations through settings

[MAIN COLOR]	[Grading SEL]	[SUB COLOR]	[3D LUT]	[CDL]	Output Picture Adjustment	
					[MON 1] [MON 2]	[EVF]
[V-Log]	[ON]	[V-Log]	[OFF]/[V-709]/ [Loaded File]	[ON]/[OFF]	V-Log Grading	V-Log Grading V-709 LCC
		[Grading]				
	[OFF]	[V-Log]	[OFF]	[OFF]	V-Log V-709	V-Log V-709 LCC
		[V-709]				
[V-709]	[OFF]	[V-709]	[OFF]	[OFF]	V-709	V-709
[3D LUT]	[OFF]	[3D LUT]	[OFF]	[OFF]	3D LUT	3D LUT

When [MAIN COLOR] is set to [V-Log] or [3D LUT], the setting in [MENU] → [CAMERA SETTINGS] → [Enhanced] → [Enhanced SW] is fixed to [OFF].

P2 card

Inserting a P2 card

When using the camera for the first time, be sure to set the time data beforehand. (page 31)
Insert the expressP2 memory card into the main slot and the microP2 memory card into the sub slot.

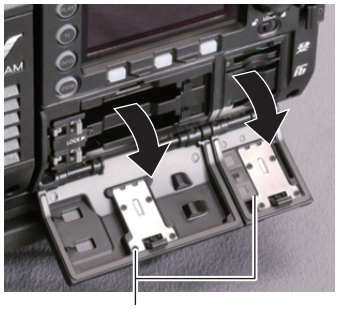


Fig. 1

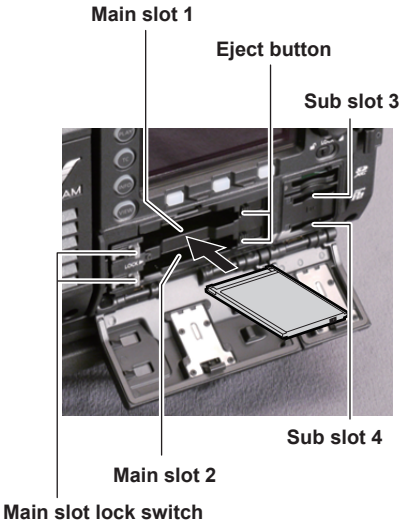


Fig. 2

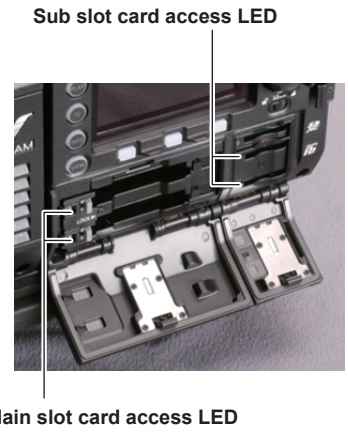


Fig. 3

1 Open the card slot cover. (Fig. 1)

2 Insert a card into the card slot. (Fig. 2)

- expressP2 memory cards (main slot)
  - Slide the main slot lock switch to the left to release the lock.
  - Insert the card with the logo facing up until the eject button pops out.
  - Press the eject button that pops up to the right.
  - Slide the main slot lock switch to the right to lock.
- microP2 memory cards (sub slot)
  - Insert with the label facing up.

3 Make sure that the card access LED is lit in orange or green. (Fig. 3) (page 37)

When two P2 cards are inserted in the card slots, the P2 card with the smaller slot number will be recorded to first. Note, however, that regardless of the slot number, if a P2 card is inserted later, that P2 card will not be accessed until the previously inserted P2 card has been recorded to.

- **Example: When expressP2 memory cards are inserted in two slots**

  If expressP2 memory cards are inserted into the two slots, the cards are used as expressP2 memory cards in the order of the slot number 1 → 2. However, if you remove the expressP2 memory card from slot 1 and then insert it again, recording to the expressP2 memory cards will take place in the order slot 2 → 1.

The P2 memory card number to be recorded to is maintained even if the camera is turned off. When the camera is next turned on, recording can be continued to the same P2 memory card as before the camera was turned off.

4 Close the cover of the main slot or sub slot.

NOTE

- The topmost slot on the sub slot side is for the SD memory card used for configuration, etc. Videos and other forms of data cannot be recorded.
- Be sure to close the card slot cover in order to prevent dropping, dust, and static electricity.
- Be sure to format P2 cards only on the camera.
- Operation is not guaranteed if SDHC/SDXC memory cards other than microP2 memory cards are used in the sub slot.
- If a microP2 memory card is inserted slowly, [FORMAT ERROR!] or [NOT SUPPORTED!] may be displayed. In such a case, insert the card again.

Removing a P2 card

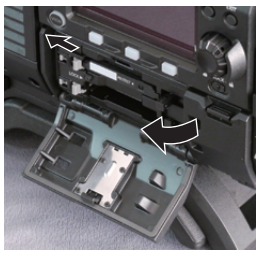


Fig. 1

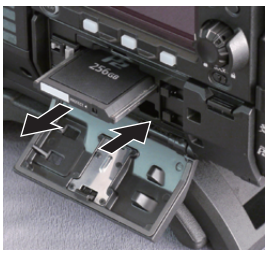


Fig. 2

1 Open the card slot cover.

2 Remove the card.

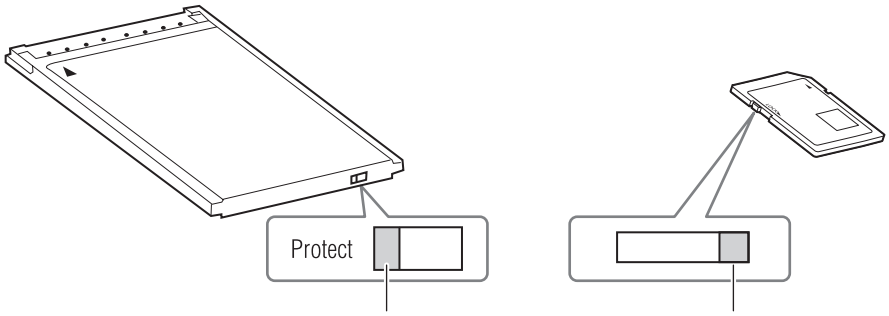
- expressP2 memory cards
  - Slide the main slot lock switch to the left to release the lock.
  - Lift the eject button (Fig. 1), and press in. (Fig. 2)
- microP2 memory cards
  - Press in the microP2 card further into the camera and let go.
  - The microP2 memory card is released from the card slot, and the microP2 memory card can be removed.

NOTE

- Do not remove the P2 card after inserting it, while it is being accessed, or being detected (card access LED flashing in orange). Otherwise, it may result in a malfunction.
- If the P2 card is removed while being accessed, [TURN POWER OFF] is displayed on the viewfinder screen, and the camera gives out a warning indication by a warning lamp, etc. Also, all card access LEDs flash rapidly in orange. Turn off the power. (page 108)
- If the P2 card is removed while being accessed, clips on it may become irregular. Check the clips and restore them, if required.
- If the P2 card being formatted is removed, formatting of the P2 card is not guaranteed. In this case, [TURN POWER OFF] is displayed on the viewfinder screen displays. Turn off the power and then back on again, and reformat the P2 card.
- If a P2 card is inserted into another slot during playback, the inserted card is not recognized and the card access LED does not light up. The P2 card will start to be recognized when playback ends.
- Even if a P2 card is inserted in a vacant card slot during recording, the P2 card may not be recognized immediately in the following instance:
  - Immediately after a recording slot is switched

Preventing accidental erasure

In order to prevent erasing the recorded contents of the P2 card by mistake, turn the write protect switch on the P2 card to the Protect side (or the LOCK side).



NOTE

- Write-protect switch can be switched while the card is being accessed (during recording or playback), but does not take effect until accessing of the card stops.

Card access LEDs and P2 card status

Card access LED	P2 card status	
Illuminated in green	Recording possible	Reading/writing are both possible.
Illuminated in orange	Recording target	Reading/writing are both possible. The card is currently the recording target (including loop recording).
Flashing in orange	Accessing card	Reading/writing are currently being performed.
Flashing in orange rapidly	The card is being recognized.	The P2 card is being recognized.

Card access LED	P2 card status	
Flashing in green slowly	Card full	There is no free space on the P2 card. Reading only is possible.
	Write protect	The write-protect switch on the P2 card is at the Protect position. Reading only is possible.
	Unrecordable card	Recording is not possible by the currently set recording format since the SD memory card, etc. is inserted. To record the card, change the recording format or use a P2 card.
Off	Card not supported	This card cannot be used on the camera. Replace the card.
	Illegal format	The P2 card is not properly formatted. Reformat the card.
	No card	The P2 card is not inserted. The card is waiting to be recognized.
	Unauthenticated card	An expressP2 memory card or microP2 memory card that cannot be authenticated. Select [MENU] → [SYSTEM SETTINGS] → [CARDS/MEDIA] → [CPS PASSWORD], and enter the password.

P2 card recording time

■ P2 cards supported on the camera

The optional expressP2, P2, and microP2 memory cards can be used with the camera.

NOTE

- AJ-P2C002SG (2 GB) cards cannot be used.
- Refer to our support desk at the following website for the latest information not included in this document.
  http://pro-av.panasonic.net/

■ Main recorder

Main recording format ([MAIN CODEC])	Setting conditions	Recording time when using a 256 GB expressP2 memory card
[AVC-Intra4K 422]	[25.00p]/[29.97p] VFR: [OFF]	Approx. 72 min
	VFR: [ON], [50fps]/[60fps]	Approx. 36 min
[AVC-Intra100]	[25.00p]/[29.97p] VFR: [OFF]	Approx. 256 min
	VFR: [ON], [50fps]/[60fps]	Approx. 128 min

■ Sub recorder

Sub recording format ([SUB CODEC])	Setting conditions	Recording time when using a 64 GB microP2 memory card
[AVC-Intra2K 422]	[25.00p]/[29.97p]	Approx. 64 min
[AVC-Intra100]	[25.00p]/[29.97p]	Approx. 64 min
[AVC-LongG50]	[25.00p]/[29.97p]	Approx. 128 min
[AVC-LongG25]	[25.00p]/[29.97p]	Approx. 256 min

NOTE

- Indicated capacities include management and other area, so the space available for recording is less than the values in the table above.

Dividing clips recorded on P2 cards

If a P2 card with a capacity of 8 GB or more are used with the camera, recording is automatically continued as another clip when a single continuous recording time exceeds the following time. The thumbnail operation (display, delete, restore, etc.) for a clip on the P2 devices can be performed as a operation for a single clip. Clips may be displayed as separate clips in nonlinear editing software and on a computer. When using an expressP2 card in AVC-Intra 4K 422, and if the recording is performed on a microP2 memory card that exceeds 32 GB in AVC-LongG 50 or AVC-LongG 25, the recording can be continued as a same clip by selecting [ONE FILE] from [MENU] → [REC SETTINGS] → [FILE SPLIT].

Recording format (excluding native recording)	Continuous recording time
AVC-Intra 4K 422 (25P/29.97P)	Approx. 1 min
AVC-Intra 100 (1080/50P, 1080/59.94P)	Approx. 3 min
AVC-Intra 100 (1080/25P, 1080/29.97P)	Approx. 5 min
AVC-LongG 50	Approx. 10 min
AVC-LongG 25	Approx. 20 min

CPS (Content Protection System)

The expressP2 and microP2 memory cards support the security function “Content Protection System” that allows encryption formatting to prevent data leakage to third parties.

To use the CPS function, set a CPS password for the camera, and enable the expressP2 or microP2 memory card authentication and encryption formatting functions. Encrypted memory cards will be automatically recognized between devices where the same CPS password is set, and recording and playback of the memory cards will be enabled. For details, refer to “Setting CPS password” (page 39).

NOTE

- From [MENU] → [SYSTEM SETTINGS] → [CARDS/MEDIA] → [CPS PASSWORD], set or delete the CPS.
- Up to 16 characters can be input.
- The encrypted memory card is not recognized in the SD card slot in a computer.
- If the card is unable to be recognized, authenticate with the correct password or format and use the card as recording media. Recording data on the card failed to be recognized cannot be checked. Do not perform any operation other than manual authentication and formatting with the failed card inserted.

Setting CPS password

To set a CPS password, either load the password from the SD memory card or use the menu of the camera to enter the password.
Only one CPS password can be set on the camera. Loading the CPS password again overwrites the previously saved password.

Loading CPS password from SD memory card

1 Download and install the latest P2 Viewer Plus into a computer.

2 With P2 Viewer Plus, generate a CPS password and write it to the SD memory card.

3 Load the CPS password file.

1) Start the camera, and insert the SD memory card into the SD card slot.
2) Open the thumbnail screen, and select [LOAD] from [MENU] → [SYSTEM SETTINGS] → [CARDS/MEDIA] → [CPS PASSWORD].
   The password file list is displayed.
3) Select a file to be used and press the jog dial button.
   - When loading of the CPS password has succeeded, the message [LOADING PASSWORD COMPLETED!] is displayed.
   - When loading of the CPS password has failed, a warning message is displayed. For an explanation of warnings, refer to “Warning system” (page 108).

NOTE

- The CPS password file generated on the SD memory card is encrypted. When it is not necessary any more, format the SD memory card, etc., for security risk management.

Setting CPS password using the menu of the camera

1 Open the thumbnail screen, and select [SET] from [MENU] → [SYSTEM SETTINGS] → [CARDS/MEDIA] → [CPS PASSWORD].
The software keyboard to enter the CPS password is displayed.

2 Enter the CPS password with the keyboard.
Enter [PASSWORD] and [RETRY PASSWORD] for verification, and select [OK] to set the CPS password.
- When entry of the CPS password has succeeded, the message [SETTING PASSWORD COMPLETED!] is displayed.
- When entry of the CPS password has failed, the warning message is displayed. For warnings description, refer to “During thumbnail and menu operation” (page 109).

NOTE

- Up to 16 characters can be input.
- The entered password cannot be displayed on the device. Do not forget the password.

Deleting CPS password

When the CPS function is no longer used, delete the CPS password.

1 Open the thumbnail screen, and select [DELETE] from [MENU] → [SYSTEM SETTINGS] → [CARDS/MEDIA] → [CPS PASSWORD].
[DELETING PASSWORD COMPLETED!] is displayed and the CPS password is deleted.

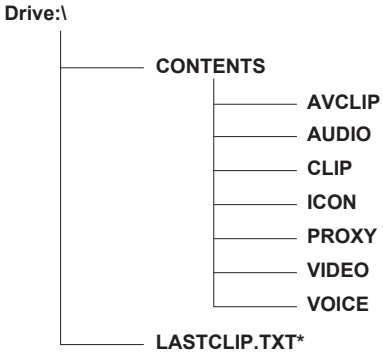
NOTE

- When the CPS password is deleted and becomes unset, the encryption format function and the automatic authentication of the encrypted memory cards are disabled.

How to handle data recorded on P2 cards

P2 cards are semiconductor memory cards that are used as the recording medium in the professional video production and broadcasting devices that make up the DVCPRO P2 series.

- Since data recorded in the P2 format is in a file format, they have excellent compatibility with computers. The file structure is a unique format, which in addition to video and audio data in MXF files contains various other important information items. The folder structure links data recorded in the P2 format as shown below.



All these folders are required.

If even part of this information is modified or deleted, the data may no longer be recognized as P2 data, or the card may no longer be able to be used with P2 devices.

*** This is the file to which the information of the final clip that was recorded with the P2 device is written.**

NOTE

- P2 cards formatted on devices other than microP2 memory card compatible devices do not have the AVCLIP folder. For P2 cards without the AVCLIP folder, the folder will automatically be created when recording is performed on microP2 memory card compatible devices.
- When transferring data from a P2 card to a computer, or when rewriting data saved on a computer back to a P2 card, to prevent data loss be sure to download the special “P2 Viewer Plus” software. For details on downloading P2 Viewer Plus and the operating environment, visit the support desk at the following website:
  http://pro-av.panasonic.net/
- Follow the steps below to use general IT tools such as Microsoft Windows Explorer or Apple Finder to transfer the data to a computer. Be sure to use P2 Viewer Plus to write data back to a P2 card.
  - Transfer the corresponding CONTENTS folder and LASTCLIP.TXT file together as a set.
  - Do not transfer individual files from the CONTENTS folder.
  - When copying, copy the LASTCLIP.TXT file at the same time as the CONTENTS folder.
  - When transferring the data in multiple P2 cards to a computer, create a folder for each P2 card to prevent clips with the same name from being overwritten.
  - Do not delete data from the P2 card.
  - Be sure to format P2 cards on the camera or the latest P2 Viewer Plus.

Formatting a P2 card

1 Select the slot of the memory card you want to format from [MENU] → [SYSTEM SETTINGS] → [CARDS/MEDIA] → [FORMAT CARD].

- Select [EXIT] when you do not wish to format the card.

2 Select [YES] using the jog dial button.

The selected P2 card is formatted.

NOTE

- Data deleted as a result of formatting cannot be restored. Always check the data before formatting.
- If the CPS password has been set, the confirmation message whether to select the encrypted format [CPS(ENCRYPT)] or normal format [NORMAL] is displayed when selecting a slot. When the encrypted format is selected, the memory card is encrypted.

Special recording functions

Hot swap recording

When P2 cards are inserted into two card slots, recording can be performed continuously across two cards.

Also, the card other than the one currently being recorded to can be swapped and recording can be continued on three or more cards (hot swap recording).

However, P2 card recognition might slow down depending on the timing (before and after continuous recording across two card slots) that the P2 card is inserted into the vacant card slot. When inserting a P2 card, make sure that there is at least one minute of free space on the card to be recorded to.

NOTE

- Hot swap playback is not supported.

Shot mark recording function

Shot mark is the mark added to the thumbnail of each clip to distinguish that clip from others.

Only clips with shot marks attached can be displayed or played back.

Adding shot marks

1 From [MENU] → [SYSTEM SETTINGS] → [USER SWITCHS], set [SHOT MARK] for any setting from [USER1] to [USER4].

2 During recording or while a clip is selected in the PLAY screen, press the button to which the shot mark is assigned.

- [MARK ON] is displayed, and the short mark is added to the recorded clip.
- Another press of the button displays [MARK OFF] and the shot mark disappears.

NOTE

- To add shot marks to combined clips, such as those recorded over multiple P2 cards, or delete them, there are following restrictions.
  - All P2 cards constituting clips must be inserted into the slots.
  - A shot mark is added only to the top clip among combined clips.

Text memo recording function

Text memos can be added to any video point.

Adding text memos

1 From [MENU] → [SYSTEM SETTINGS] → [USER SWITCHS], set [TEXT MEMO] for any setting from [USER1] to [USER4].

2 During a pause or while a clip is selected in the PLAY screen, press the button to which the text memo is assigned.

[TEXT MEMO] is displayed, and the text memo is added to the video clip that was displayed when the button was pressed.

NOTE

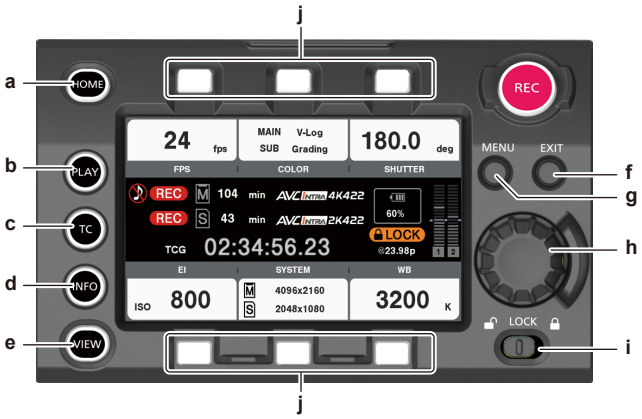
- Up to 100 text memos can be recorded to a single clip.

Chapter 5 Control Panel

This chapter describes how to change each setting and check the setting status using the control panel.

Control panel operation

Basic camera operations can be performed using the control panel.
When the setting is changed in the control panel, the setting in the [MENU] is also changed in conjunction.



a: <HOME> button
b: <PLAY> button
c: <TC> button
d: <INFO> button
e: <VIEW> button
f: <EXIT> button
g: <MENU> button
h: Jog dial button
i: <LOCK> switch
j: Control panel operation buttons

Camera status display

1 Recording status display
Top: Main slot recording status display
- [REC]: Currently recording

: When audio is not being recorded

Bottom: Sub slot recording status display
- [REC]: Currently recording

2 Media free space display
Top: Main slot media remaining capacity display
Bottom: Sub slot media remaining capacity display
- [∗∗∗min]: Remaining capacity (0 to 599 minutes)
- [∗∗h]: Remaining capacity (more than 10 hours)
- [END]: No remaining free space
- [WP]: Write protected
- [OFF]: When [SUB CODEC] is [OFF]

3 Codec display
Top: Main slot codec display ([MAIN CODEC] setting value)
Bottom: Sub slot codec display ([SUB CODEC] setting value)

4 Battery display
- Changes to → → → → as the battery charge level gets lower.
- (yellow): Battery charge level is low.
- (red): Battery charge has run out.
- [∗∗.∗V]: Displays the battery charge level in units of 0.1 V.
- [∗∗∗%]: Displays the battery charge level with charge level information in %.

5 Audio level meter display

- Channel display
  [1]/[2] or [3]/[4]
- Level meter display
  Displays the level represented by 19 bars. (2 dB increments)
- Standard level bar
  At the –18 dB position or the –20 dB position
  The standard is in [MENU] → [SYSTEM SETTINGS] → [AUDIO LEVEL] → [HEADROOM]

6 Warning/error displays

: Warning (details are displayed on the time code display in the following cases)

- [SYSTEM ERROR !]
- [TURN POWER OFF !]
- [REC WARING !]
- [CARD ERROR !] (when recording has stopped)
- [LOW BATTERY !]
- [MEDIA END !]

: Alert

7 Time code display

- [TCG 12:59:59:20]: Displays the time code generator value.
- [TCR 12:59:59:20]: Displays the time code reader value.
- [UBG AB CD EF 98]: Displays the user bits generator value.
- [UBR AB CD EF 98]: Indicates the user bits reader value.
- [Dur.00:59:59:23]: Displays the duration.

8 Lock display

Displayed when button operations are disabled due to the <LOCK> switch.

Using the control panel extension unit

The control panel can still be used after it is removed. To remove the control panel, set the <POWER> button to <OFF>.

Fig. 1

Fig. 2

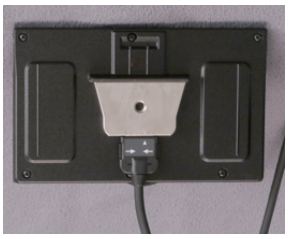


Fig. 3

1 Press the <RELEASE> switch while lifting up the control panel. (Fig. 1)

The control panel will come off.

2 Attach the control panel extension unit. (Fig. 2)

3 Connect the control panel extension unit cable to the control panel. (Fig. 3)

Securing the control panel using the control panel mounting part

The removed control panel can be secured using the control panel mounting part.

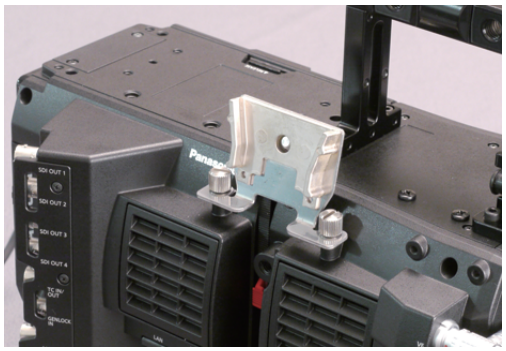


Fig. 1

Fig. 2

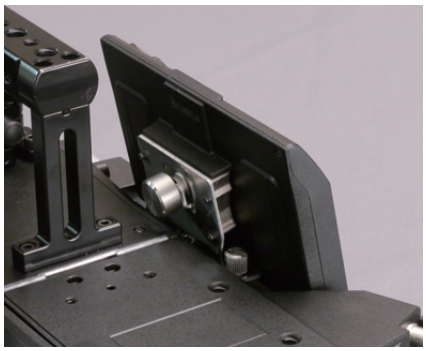


Fig. 3

1 **Mount the control panel mounting part. (Fig. 1)**

2 **Mount the control panel onto the control panel mounting part. (Fig. 2)**

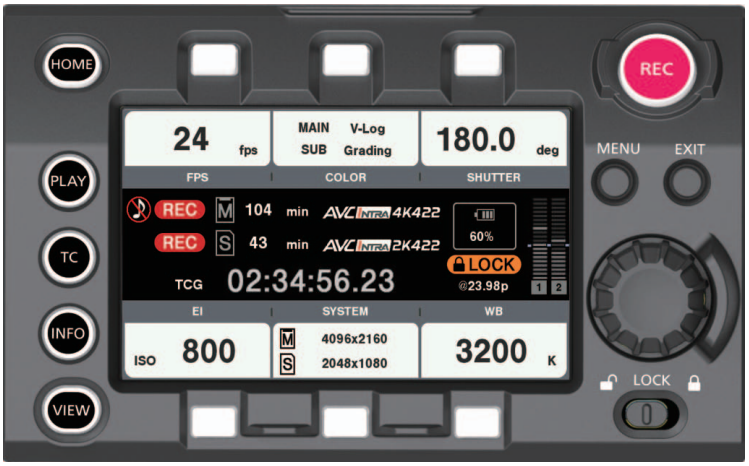
3 **Secure the control panel using screws. (Fig. 3)**

NOTE

- Use the cable clamp to prevent the cable from getting snagged.

HOME screen

The Home screen displays the basic camera settings and is used to change those settings.

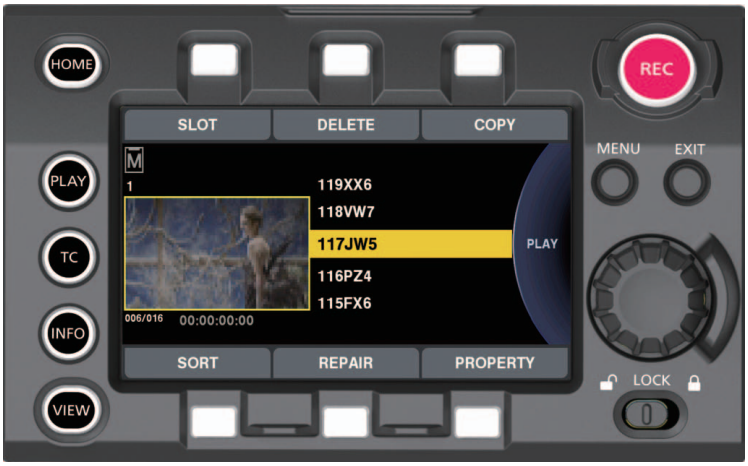


[FPS]	Sets the frame rate.	
	[VFR]	Toggles the variable frame rate. When this is [OFF], the frame rate become 1x the rate set in [MENU] → [SYSTEM SETTING] → [FREQUENCY]. • When this is [ON], audio cannot be recorded. Audio is recorded at the sub recorder.
	[PRESET]	Mode for selecting preset frame rates. Up to 12 presets can be stored in memory. Presets can be added/deleted using [ADD]/[DEL].
	[FPS]	Mode for selecting from the overall variable range. The variable step changes through [FINE]/[NORMAL]/[COARSE].
[SHUTTER]	Sets the shutter speed.	
	[ON]/[OFF]	[OFF] means shutter off (open angle 360 deg).
	[PRESET]	Mode for selecting preset shutter speeds. Up to 12 can be registered. Presets can be added/deleted using [ADD]/[DEL].
	[SYNCHRO]	Mode for selecting from the overall variable range. The variable step changes through [FINE]/[COARSE].
	[deg/sec]	Determines the shutter setting unit. [deg]: Open angle [sec]: Second
[EI]	Sets the EXPOSURE INDEX (gain).	
	[ISO/dB]	Selects the setting method.
[WB]	Sets the color temperature (white balance).	
	[AWB]	Executes automatic white balancing.
	[PRESET]	Mode for selecting preset white balance values. Up to 12 can be registered. Presets can be added/deleted using [ADD]/[DEL]. If [AWB] is performed, the results are automatically added to the choices.
	[TEMP SHIFT]	Mode for making adjustments from the overall variable range.
	[GMg]	Shifts to the Green-Magenta axis.
[COLOR]	Sets the video colors (gamma and gamut).	
	[MAIN COLOR]	Sets the output colors of videos from terminals <SDI OUT1> to <SDI OUT4> as well as videos recorded in the main recorder.
	[SUB COLOR]	Sets the colors of videos recorded in the sub recorder.
	[Grading SEL]	Sets the grading function. [MAIN COLOR] is only enabled in [V-Log] mode.
	[3D LUT]	Sets the grading in the [3D LUT]. [Grading SEL] is disabled when this is [OFF]. Reads from the SD memory card when [Grading SEL] is set to [ON].
	[CDL]	Sets the grading in [CDL]. [Grading SEL] is disabled when this is [OFF]. When [Grading SEL] is set to [ON] • Sets [Slope]/[Offset]/[Power]/[Saturation] on the control panel. • Reads from the SD memory card using [File Load].
	[MON SET]	Sets the display colors of [MON OUT]/[VF].
[SYSTEM]	Sets the camera's system.	
	[FREQUENCY]	Sets the system frequency.
	[PIXEL]	Sets the camera's main resolution (number of pixels).

	[MAIN CODEC]	Sets the main recorder's codec. The camera's basic system are determined by 3 settings: [FREQUENCY], [PIXEL], and [CODEC MAIN]. Restarting the system may be necessary if basic system settings are changed. After confirming the three settings, restart in accordance with the guide.
	[SUB CODEC]	Sets the sub recorder's codec.
	[AUDIO]	Sets the audio input and recording. [VR]: Sets the input volume. [IN]: Sets input channel switching and level control. [OUT]: Sets the output to a speaker or headphone.

PLAY screen

The Play screen is the screen for playing recorded videos.



You can select clips by turning the jog dial button.
Play the clip selected in the middle by pressing the jog dial button.
At the end of the clip, the display will return to the list display.
Playback is paused by pressing the jog dial button.
Fast-forward/cue is performed by turning the jog dial button during playback.

[SLOT]	Switches between the main recorder and sub recorder. Displays the selected recorder on the upper left. [M]: Main recorder [S]: Sub recorder
[DELETE]	Deletes selected clips.
[COPY]	Copies selected clips.
[SORT]	Sets the conditions for displaying clips in a list.
[REPAIR]	Selects and repairs the target clip (file).
[PROPERTY]	Displays the properties of the clip selected in the middle.

TC screen

The TC screen is the screen for setting the time code.

[TC/UB/Dur.]	Switches between the HOME screen and status display. [TC]: Time code [UB]: User bits [Dur.]: Duration
[FREE/REC RUN]	Switches between free run and recording run. This is fixed to recording run when the variable frame rate function is enabled.
[DF/NDF]	Switches between drop frame and non-drop frame.
[SET]	Sets the time code generator.

INFO screen

The INFO screen displays information about the camera.

[DIAGNOSTICS]	Displays camera statuses such as warnings.
[FPS]	Displays all frequency settings together.
[VERSION]	Displays the firmware version. [UPDATE]: Performs an update of the firmware.
[PERIPHERAL]	Displays information about peripheral devices (USB, network, etc).
[HISTORY]	Performs operations related to services. [Online]: Enters the support mode using PASS (P2 Asset Support System). [TRACE LOG]: Writes the trace log to an SD memory card.
[CARDS]	Performs operations related to recording media such as formatting, etc. [AUTHENTICATE]: Moves to the screen for performing CPS (card authentication system) operations. [FORMAT]: Moves to the screen for performing card formatting operations.

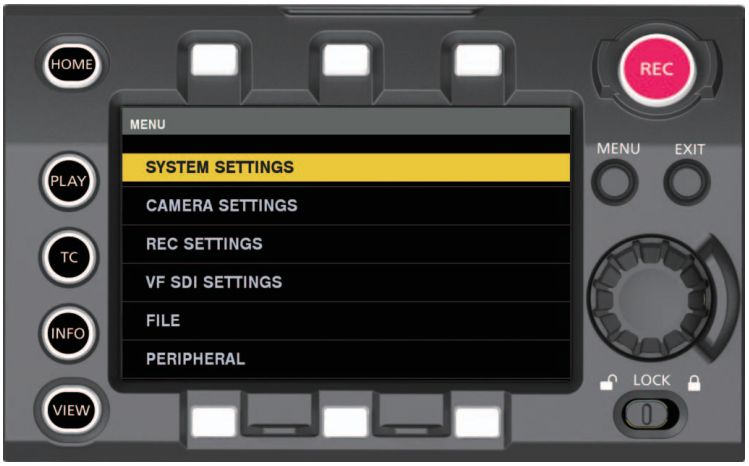
VIEW screen

Displays video. For status display contents, configure [MENU].

MENU screen

Displays the [MENU].

Depending on the [MENU] → [SYSTEM SETTINGS] → [MON OUT] → [MENU DISP] setting, [MENU] is displayed for the output from the <MON OUT1> terminal and <MON OUT2> terminal.



Chapter 6 Audio recording

This chapter describes how to prepare and adjust audio recorded at the time of shooting.

Preparing for audio input

Prepare the camera for connecting audio input devices.

Using front microphone

Microphones such as the stereo microphone kit AJ-MC900G (optional) can be mounted.

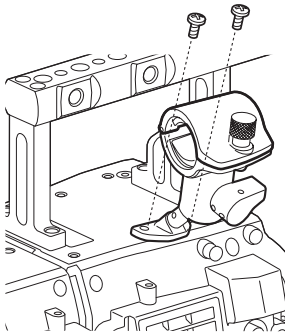


Fig. 1

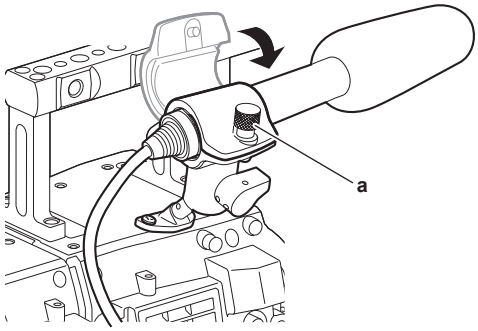


Fig. 2

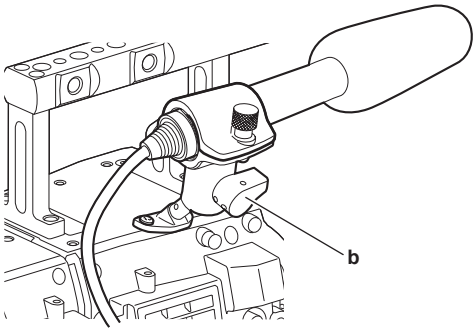


Fig. 3

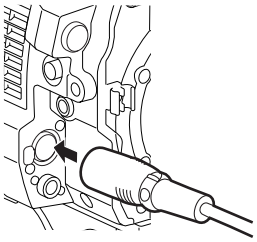


Fig. 4

1 Remove the screws at the microphone holder mounting position and attach the microphone holder AJ-MH800G (optional). (Fig. 1)

2 Attach the microphone and tighten the clamping screw (a). (Fig. 2)

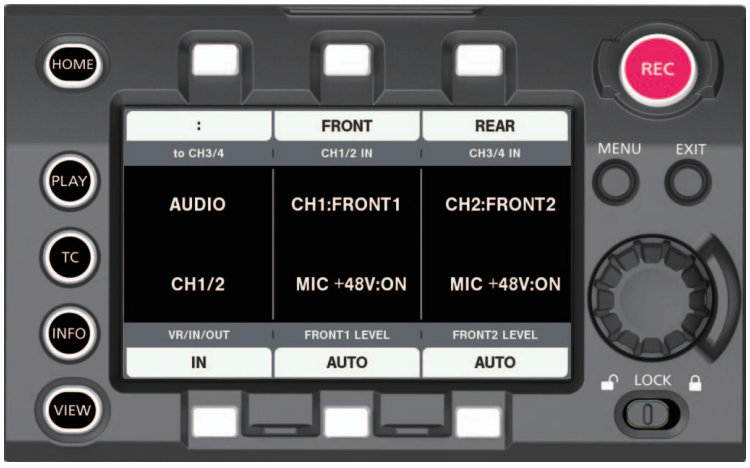
Mount with the UP indication on the microphone facing up.

3 Loosen the lock lever (b), adjust the angle of the microphone, and tighten the lock lever. (Fig. 3)

4 Connect the microphone cable to the <MIC IN> terminal on the camera module. (Fig. 4)

5 According to the audio channel to be recorded, select [FRONT] in control panel audio input.

Setting the audio input using the control panel



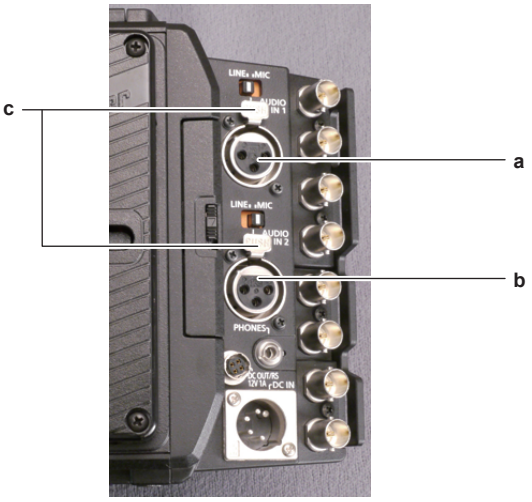
1 Press the <HOME> button to display the HOME screen.

2 From [SYSTEM] → [AUDIO] → [VR/IN/OUT], select [IN].

3 Select [FRONT] in [CH1/2 IN].

[CH3/4 IN] is automatically set to [REAR].

Using audio devices



a: <AUDIO IN 1> terminal

b: <AUDIO IN 2> terminal

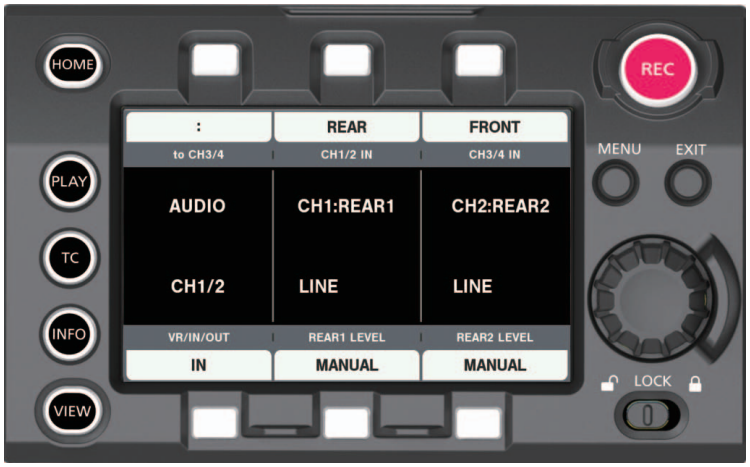
c: <LINE>/<MIC> switch

1 Connect the audio device to the <AUDIO IN 1> or <AUDIO IN 2> terminal of the recording module using the XLR cable.

2 According to the channel to which the XLR cable is connected, select [REAR] in control panel audio input.

3 Switch the <LINE>/<MIC> switch on the <AUDIO IN 1> terminal or <AUDIO IN 2> terminal to <LINE>.

Setting the control panel



1 Press the <HOME> button to display the HOME screen.

2 From [SYSTEM] → [AUDIO] → [VR/IN/OUT], select [IN].

3 Select [REAR] in [CH1/2 IN].

[CH3/4 IN] is automatically set to [FRONT].

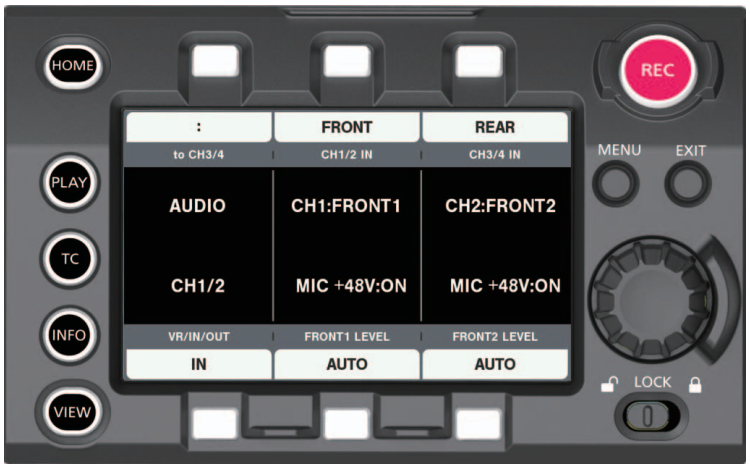
NOTE

- When the input signal is digital audio (AES/EBU format), set [MENU] → [SYSTEM SETTINGS] → [AUDIO INPUT] → [AES/EBU IN] to [ON]. All 4 channels become digital inputs, and audio input setting and level adjustment are disabled.

Selecting audio input and adjusting recording levels

The camera supports independent 4-channel sound recording in all recording formats.

Selecting audio input signals



1 Press the <HOME> button to display the HOME screen.

2 From [SYSTEM] → [AUDIO] → [VR/IN/OUT], select [IN].

3 Select [FRONT] in [CH1/2 IN].

[CH3/4 IN] is automatically set to [REAR].

NOTE

- When the input signal is in AES/EBU format, all 4 channels become AES/EBU input, and audio input signal setting is disabled.
- The audio signal to be recorded is output straight as SDI signal. The details regarding audio is set in [MENU] → [SYSTEM SETTINGS] → [AUDIO INPUT], [AUDIO LEVEL], and [AUDIO OUTPUT].

Adjusting the recording levels

The camera performs manual adjustment and automatic adjustment of recording levels.

Automatic adjustment

The recording levels in audio channel 1/2 can be automatically adjusted. When audio channels 1/2 are set to [FRONT], audio channels 3/4 can be set in the same manner.

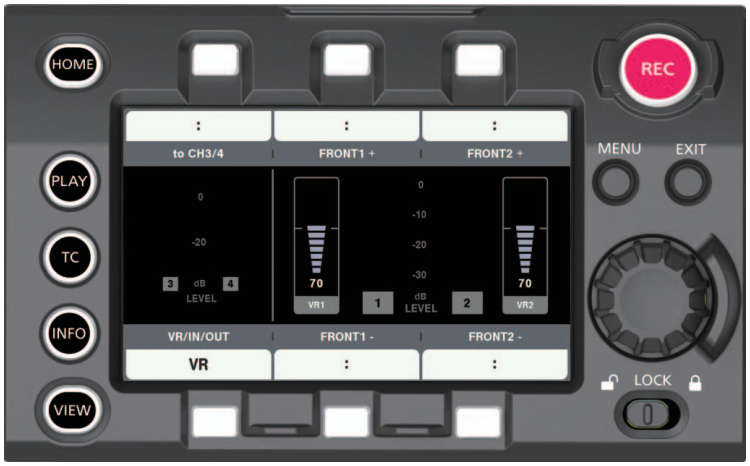
1 Press the <HOME> button to display the HOME screen.

2 From [SYSTEM] → [AUDIO] → [VR/IN/OUT], select [IN].

3 Select [AUTO] in [FRONT1 LEVEL] or [FRONT2 LEVEL].

Manual adjustment

Recording levels in audio channel 1/2 can be manually adjusted. When audio channels 1/2 are set to [FRONT], audio channels 3/4 can be set in the same manner.



1 Press the <HOME> button to display the HOME screen.

2 From [SYSTEM] → [AUDIO] → [VR/IN/OUT], set [IN].

For [CH3/4], switch to [CH1/2] in [to CH1/2].

3 Select [MANUAL] in [FRONT1 LEVEL] or [FRONT2 LEVEL].

If [AUTO] is selected, [A] is displayed on the [VR] screen and manual adjustment is not possible.

4 From [SYSTEM] → [AUDIO] → [VR/IN/OUT], select [VR].

5 Make adjustments using [FRONT1+]/[FRONT1–] or [FRONT2+]/[FRONT2–] while viewing the audio channel level meter display.

When the topmost bar (0 dB) is exceeded, the red bar display lights up to indicate that input volume is excessive. Adjust the maximum level so that the display does not reach 0 dB.

■ **Recording standard level**

In [MENU] → [SYSTEM SETTINGS] → [AUDIO LEVEL] → [HEADROOM], [18dB] or [20dB] can be selected.
Common settings for channels 1 through 4.

NOTE

- When the level adjustment is set to [MANUAL], set whether to enable [FRONT1 LIMITER]/[FRONT2 LIMITER]/[REAR1 LIMITER]/[REAR2 LIMITER] in [MENU] → [SYSTEM SETTING] → [SYSTEM MODE] → [AUDIO LEVEL]. This is set to [OFF] in the factory settings.

Audio monitor (headphones)

You can listen to the camera's audio using headphones.

1 Press the <HOME> button to display the HOME screen.

2 From [SYSTEM] → [AUDIO] → [VR/IN/OUT], select [OUT].

■ **Setting the headphones output audio**

1 Select the output signal (mono, stereo, mix) in [MONITOR].

■ **Adjusting the headphones output audio level**

1 Adjust with the [MON+]/[MON–] dial.

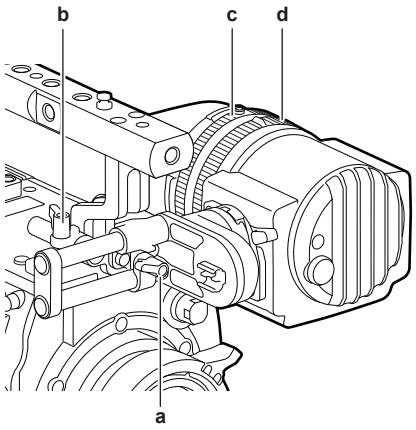
Chapter 7 Viewfinder

This chapter describes the viewfinder screen display and how to make adjustments.

Adjusting and setting the viewfinder

The camera's panel is OLED (organic EL).
Positioning your eye near the viewfinder will trigger the eye sensor to automatically display the image.

Adjustment method



a: Lock lever (left/right position)
b: Lock lever (front/back position)
c: Visibility adjustment ring
d: Zoom ring

■ **Left/right position adjustment**

1 Loosen the lock lever (left/right positions).

2 Slide the viewfinder from side to side.

Adjust to a comfortable position.

3 Lock the lock lever (left/right position).

■ **Front/back position adjustment**

1 Loosen the lock lever (front/rear positions).

2 Slide the viewfinder back and forth.

Adjust to a comfortable position.

3 Lock the lock lever (front/back position).

■ **Visibility adjustment**

1 Turn the visibility adjustment ring while pressing holding the upper button.

Visibility adjustment range: –3.6 D - +1.4 D

■ **Zoom adjustment**

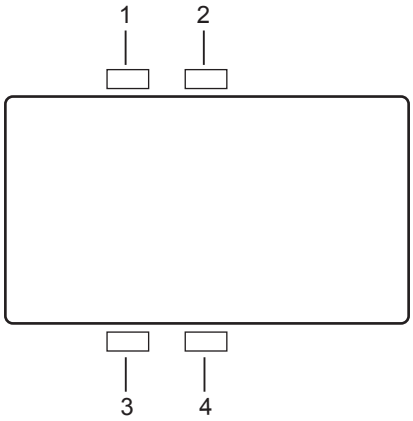
1 Adjust by turning the zoom ring.

Adjust to a comfortable view angle while checking the video.
Perform adjustment when adjusting the focus.
Vignetting may occur around the screen of the enlarged image.

Viewfinder status display

In addition to video, the viewfinder displays messages, a center marker, safety zone marker, zebra patterns, and other information that indicate the camera settings and operation status.

Lamp display



1 Green tally lamp
Lights up in green when green tally signals are received.

2 Red tally/recording lamp
Lights up in red during recording or when red tally signals are received.

3 Warning lamp
Flashes or lights up when a warning occurs with the camera.

4 Battery lamp
Starts flashing when the remaining battery level is low. It is illuminated after the battery is completely flat.

Status display

Refer to “Status display (STATUS) in the <MON OUT1>, <MON OUT2>, and <VF SDI> outputs.”.

Adjusting the screen

1 Press the <EVF MENU> button.
Screen adjustment items are displayed on the upper part of the screen.

2 Turn the jog dial button to select the items you want to adjust.

3 Press the jog dial button.

4 Turn the jog dial button to make adjustments.

5 Press the jog dial button.

6 Press the <EVF MENU> button.
The screen adjustment items display disappears.
This can also be done in [EVF MENU] → [DISPLAY SETUP].

Direct camera settings

The following camera settings can be set directly through viewfinder operation.
[FPS]/[SHUTTER]/[EI]/[WB]

1 Press the <CAM MENU> button of the viewfinder.
Setting items are displayed on the lower part of the screen.

2 Turn the jog dial button to select the items you want to set.

3 Press the jog dial button.

4 Turn the jog dial button to select setting details.

5 Press the <CAM MENU> button.

[MENU] settings from the viewfinder

The camera’s [MENU] can be directly configured through viewfinder operation.

1 Press and hold the <CAM MENU> button of the viewfinder for at least two seconds.
The camera [MENU] is displayed.

[MENU] is also displayed on the camera's operation panel.

[EVF MENU] operation

1 Press and hold the <EVF MENU> button for at least two seconds.

[EVF MENU] is displayed.

[EVF MENU] list

■ [DISPLAY SETUP]

Item	Description of settings
[CONTRAST]	Adjusts the contrast. **[–32]…[31]** • Factory setting: [0]
[BRIGHT]	Adjusts the brightness. **[–32]…[31]** • Factory setting: [0]
[COLOR]	Adjusts the color level. **[–32]…[31]** • Factory setting: [0]
[R BRT]	Adjusts the red color brightness. **[–32]…[31]** • Factory setting: [0]
[G BRT]	Adjusts the green color brightness. **[–32]…[31]** • Factory setting: [0]
[B BRT]	Adjusts the blue color brightness. **[–32]…[31]** • Factory setting: [0]

■ [SW MODE]

Item	Description of settings
[FALSE COLOR TYPE]	Selects the color type of the false color. **[1]/[2]**
[FRONT TALLY]	Enables/disables the front tally lamp function. **[ON]/[OFF]**
[EYE SENSOR]	Sets sensitivity of eye sensor. **[NORMAL]:** Displays the viewfinder screen according to the eye sensor. **[10SEC]:** Keeps the viewfinder screen display for 10 seconds after the eye sensor is released.
[B/W]	Switches to monochrome mode. **[ON]:** Display will be all black and white. **[OFF]:** Disables the monochrome mode.
[SCAN]	Reverses the display. **[NORMAL]/[REVERSE]**

■ [USER SW 1]/[USER SW 2]

Selects the function assigned to the <EVF USER 1>/<EVF USER 2> button.

The settings configured here are applied to the settings in the camera's [MENU] → [VF SDI SETTINGS] mutually.
(excluding [FALSE COLOR])

Description of settings
[MARKER]: Displays/hides markers. **[CENTER MARKER]:** Displays/hides the center marker. **[SAFETY MARKER]:** Switches the display/hide of the safety marker. **[FRAME MARK]:** Displays/hides the frame marker. **[USER BOX]:** Displays/hides the user box. **[ZEBRA]:** Displays/hides the zebra display. **[EXPAND]:** Enables/disables the display enlargement function. **[ASSIST]:** Enables/disables the focus assist function. **[FALSE COLOR]:** Enables/disables false color mode. **[SURROUND VIEW]:** Enables/disables the surround view function. **[SURROUND VIEW LINE]:** Displays/hides the surround view area marker display. **[SMOOTH MODE]:** Enables/disables the smooth mode. **[WFM]:** Displays/hides waveform monitor.

■ [INFORMATION]

Item	Description of settings
[OPERATION TIME]	Displays the total display time of the organic EL panel of the viewfinder.
[VERSION]	Displays the firmware version of the viewfinder.

False color mode

Check the exposure using the false color.
Image will be displayed with colors sored by luminosity signals. Images of other levels are displayed in black and white.

Display patterns

Color	Level		Description
	Type 1	Type 2	
(Red)	108.0% - 109.5%	93.6% - 94.7%	White-level clip
(Yellow)	98.0% - 100.0%	90.6% - 93.5%	Lower area of the white-level clip
(Pink)	42.0% - 44.0%	50.0% - 51.7%	One-stopover color from neutral gray
(Green)	28.0% - 32.0%	37.8% - 41.8%	18% gray neutral color
(Blue)	3.8% - 4.5%	3.8% - 4.5%	Upper area of the black-level clip
(Purple)	0% - 3.7%	0% - 3.7%	White-level clip

Convenient shooting functions

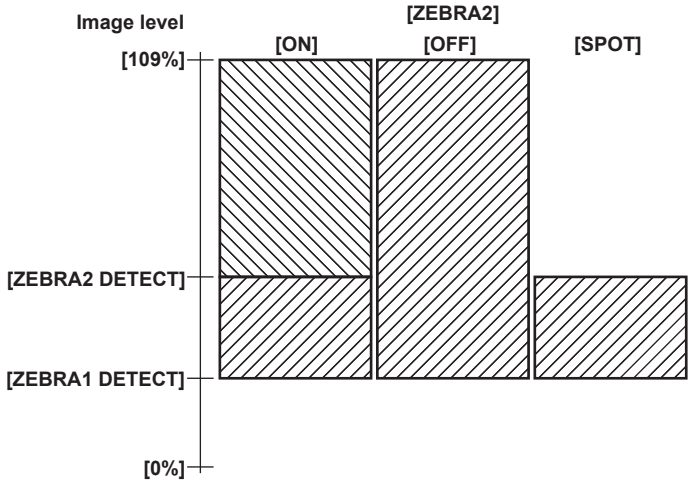
Zebra patterns display

The camera can display two types of zebra patterns.

The level for zebra pattern display can be set in [MENU] → [VF SDI SETTINGS] → [ZEBRA].

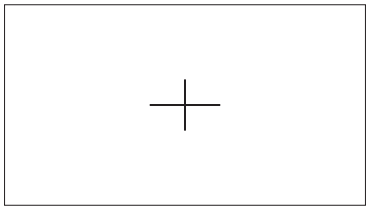
Item	Description of settings
[ZEBRA MASTER SW]	Sets whether to superimpose the zebra signal on the output from the <VF> terminal and <VF SDI> terminal. **[ON], [OFF]** • Factory setting: [OFF]
[ZEBRA2 SW]	Enables/disables zebra pattern 2 and selects [SPOT]. **[ON], [SPOT], [OFF]** • Factory setting: [OFF]
[ZEBRA1 DETECT]	Sets the detection level of zebra pattern 1. **[0%]…[109%]** • Factory setting: [80%]
[ZEBRA2 DETECT]	Sets the detection level of zebra pattern 2. **[0%]…[109%]** • Factory setting: [100%]

[SPOT]: The image level from the setting value of [ZEBRA1 DETECT] to the setting value of [ZEBRA2 DETECT] is displayed in the zebra pattern.



Displaying the center marker

The marker is displayed when a setting other than [OFF] is set in [MENU] → [VF SDI SETTINGS] → [MARKER] → [CENTER MARKER].



Displaying the safety zone marker

Items selected in [MENU] → [VF SDI SETTINGS] → [MARKER] → [SAFETY MARKER] are displayed.

The size of the safety zone marker can be changed in [MENU] → [VF SDI SETTINGS] → [MARKER] → [SAFETY AREA].

Displaying frame marker

The marker is displayed when [MENU] → [VF SDI SETTINGS] → [MARKER] → [FRAME MARK] is set to [ON].

Set the view angle in [MENU] → [VF SDI SETTINGS] → [MARKER] → [FRAME SIG].

Set the outside level in [MENU] → [VF SDI SETTINGS] → [MARKER] → [FRAME LEVEL].

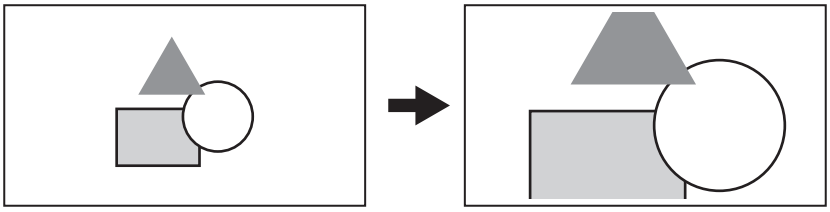
Focus assist function

The focus assist function enables you to focus the target easily.

Enlarged display in the output image from the viewfinder or <VF SDI> terminal, peaking display (display with the contours of the image in red), focus square display (display in the size of a square displayed in each area), and focus bar display are available.

Expanded display

Set [MENU] → [VF SDI SETTINGS] → [ASSIST] → [EXPAND SW] to [ON].



- In the expanded display, the status display and zebra pattern disappear.
- You can set the display mode in [MENU] → [VF SDI SETTINGS] → [ASSIST] → [EXPAND POS]/[EXPAND VALUE]/[EXPAND MODE].

NOTE

- The output video from the viewfinder screen and <VF SDI> terminal are enlarged.
- Images output from the <SDI OUT1>/<SDI OUT2>/<SDI OUT3>/<SDI OUT4> terminals and the <MON OUT1> terminal are not expanded.
- When [VF] is selected in [MENU] → [SYSTEM SETTINGS] → [MON OUT] → [MON OUT2 SIGNAL SEL], output from the <MON OUT2> terminal is the same with the output from the <VF SDI> terminal.

Advanced assist function

Peaking display (focus in red)

Set [MENU] → [VF SDI SETTINGS] → [ASSIST] → [ADVANCED ASSIST SW] to [ON].

Set [MENU] → [VF SDI SETTINGS] → [ASSIST] → [PEAKING SW] to [ON].

Set [MENU] → [VF SDI SETTINGS] → [ASSIST] → [COLOR] to [RED].

Adjust the focus so that the contours of the subject you want to focus on turn red.

In [MENU] → [VF SDI SETTINGS] → [ASSIST] → [COLOR], [GREEN] or [WHITE] can be selected.

NOTE

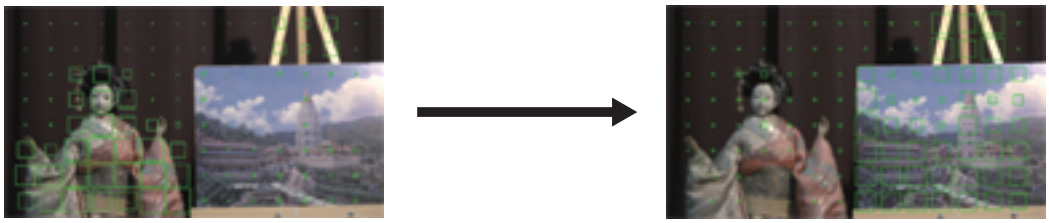
- Only the output video from the viewfinder screen and <VF SDI> terminal are displayed.

Focus square display

Set [MENU] → [VF SDI SETTINGS] → [ASSIST] → [ADVANCED ASSIST SW] to [ON].

Set [MENU] → [VF SDI SETTINGS] → [ASSIST] → [FOCUS SQUARES SW] to [ON].

Adjust the focus so that the square size displayed in the area of the subject to be focused becomes the largest.



When focused on the doll **When focused on the panel**

NOTE

- Only the output video from the viewfinder screen and <VF SDI> terminal are displayed.

Focus bar display

The focus bar can be displayed when [ON] is set in [MENU] → [VF SDI SETTINGS] → [ASSIST] → [FOCUS BAR SW].

The degree of focus is indicated by the length of the bar.

- White bar: Focus bar display
- Green line: Peak display

Not in focus **The bar extends to the right when the viewfinder is in-focus.**

NOTE

- Only the output video from the viewfinder screen and <VF SDI> terminal are displayed.

Chapter 8 Output and Screen Display

This chapter describes video output.

SDI output

Output format is set in [MENU] → [SYSTEM SETTINGS] → [SDI OUT].

One type of image is output from the four BNC terminals: <SDI OUT1> to <SDI OUT4>.

If the setting does not require all four terminals, there may be terminals that do not provide output. If the output format is 3G × 2, images are output from the <SDI OUT1> and <SDI OUT2> terminals, and are not output from the <SDI OUT3> and <SDI OUT4> terminals.

Status, markers, etc. cannot be displayed.

During playback with the sub recorder, output is muted and the screen becomes black.

Output format list

— indicates that the item is not affected by the settings.

∗∗P becomes the setting value of [SYSTEM MODE] → [FREQUENCY].

[SYSTEM MODE]			[VFR SW]	[SDI OUT]		Output Format	
[FREQUENCY]	[PIXEL]	[MAIN CODEC]		[P to PsF]	[4K OUT TYPE]	Signal	Format
[23.98p] [29.97p]	[4096×2160]	[AVC-Intra4K 422]	[OFF]	—	[SQUARE]	4096×2160 ∗∗P 4:2:2	1.5G×4
				—	[2 SAMPLE INT]	4096×2160 ∗∗P 4:2:2	3G×2
			[ON]	—	[SQUARE]	4096×2160 59.94P 4:2:2	3G×4
				—	[2 SAMPLE INT]	4096×2160 59.94P 4:2:2	3G×4
[59.94p]	[4096×2160]	[AVC-Intra4K 422]	—	—	[SQUARE]	4096×2160 59.94P 4:2:2	3G×4
				—	[2 SAMPLE INT]	4096×2160 59.94P 4:2:2	3G×4
[25.00p]	[4096×2160]	[AVC-Intra4K 422]	[OFF]	—	[SQUARE]	4096×2160 25.00P 4:2:2	1.5G×4
				—	[2 SAMPLE INT]	4096×2160 25.00P 4:2:2	3G×2
			[ON]	—	[SQUARE]	4096×2160 50.00P 4:2:2	3G×4
				—	[2 SAMPLE INT]	4096×2160 50.00P 4:2:2	3G×4
[50.00p]	[4096×2160]	[AVC-Intra4K 422]	—	—	[SQUARE]	4096×2160 50.00P 4:2:2	3G×4
				—	[2 SAMPLE INT]	4096×2160 50.00P 4:2:2	3G×4
[23.98p] [29.97p]	[3840×2160]	[AVC-Intra4K 422]	[OFF]	—	[SQUARE]	3840×2160 ∗∗P 4:2:2	1.5G×4
				—	[2 SAMPLE INT]	3840×2160 ∗∗P 4:2:2	3G×2
			[ON]	—	[SQUARE]	3840×2160 59.94P 4:2:2	3G×4
				—	[2 SAMPLE INT]	3840×2160 59.94P 4:2:2	3G×4
[59.94p]	[3840×2160]	[AVC-Intra4K 422]	—	—	[SQUARE]	3840×2160 59.94P 4:2:2	3G×4
				—	[2 SAMPLE INT]	3840×2160 59.94P 4:2:2	3G×4

[SYSTEM MODE]			[VFR SW]	[SDI OUT]		Output Format	
[FREQUENCY]	[PIXEL]	[MAIN CODEC]		[P to PsF]	[4K OUT TYPE]	Signal	Format
[25.00p]	[3840×2160]	[AVC-Intra4K 422]	[OFF]	—	[SQUARE]	3840×2160 25.00P 4:2:2	1.5G×4
				—	[2 SAMPLE INT]	3840×2160 25.00P 4:2:2	3G×2
			[ON]	—	[SQUARE]	3840×2160 50.00P 4:2:2	3G×4
				—	[2 SAMPLE INT]	3840×2160 50.00P 4:2:2	3G×4
[50.00p]	[3840×2160]	[AVC-Intra4K 422]	—	—	[SQUARE]	3840×2160 50.00P 4:2:2	3G×4
				—	[2 SAMPLE INT]	3840×2160 50.00P 4:2:2	3G×4
[23.98p] [29.97p]	[1920×1080]	[AVC-Intra100]	[OFF]	[P]	—	1920×1080 **P 4:2:2	1.5G×1
				[Psf]	—	1920×1080 **Psf 4:2:2	1.5G×1
			[ON]	—	—	1920×1080 59.94P 4:2:2	3G×1
[59.94p]	[1920×1080]	[AVC-Intra100]	[OFF]	—	—	1920×1080 59.94P 4:2:2	3G×1
			[ON]	—	—	1920×1080 59.94P 4:2:2	3G×1
[25.00p]	[1920×1080]	[AVC-Intra100]	[OFF]	[P]	—	1920×1080 25.00P 4:2:2	1.5G×1
				[Psf]	—	1920×1080 25.00Psf 4:2:2	1.5G×1
			[ON]	—	—	1920×1080 50.00P 4:2:2	3G×1
[50.00p]	[1920×1080]	[AVC-Intra100]	[OFF]	—	—	1920×1080 50.00P 4:2:2	3G×1
			[ON]	—	—	1920×1080 50.00P 4:2:2	3G×1

<MON OUT1> output

Output format is set in [MENU] → [SYSTEM SETTINGS] → [MON OUT].
Status display is set in [MENU] → [SYSTEM SETTINGS] → [MON OUT INDICATOR].
Marker display is set in [MENU] → [SYSTEM SETTINGS] → [MON OUT MARKER].

Output format list

[SYSTEM MODE]			[MON OUT]	Output Format	
[FREQUENCY]	[PIXEL]	[MAIN CODEC]	[1080p to 1080i]	Signal	Format
[23.98p] [29.97p] [59.94p]	[4096×2160]	[AVC-Intra4K 422]	[OFF]	2048×1080 59.94P 4:2:2	3G
			[ON]	1920×1080 59.94i 4:2:2	1.5G*
[25.00p] [50.00p]	[4096×2160]	[AVC-Intra4K 422]	[OFF]	2048×1080 50.00P 4:2:2	3G
			[ON]	1920×1080 50.00i 4:2:2	1.5G*
[23.98p] [29.97p] [59.94p]	[3840×2160] [1920×1080]	[AVC-Intra4K 422] [AVC-Intra100]	[OFF]	1920×1080 59.94P 4:2:2	3G
			[ON]	1920×1080 59.94i 4:2:2	1.5G
[25.00p] [50.00p]	[3840×2160] [1920×1080]	[AVC-Intra4K 422] [AVC-Intra100]	[OFF]	1920×1080 50.00P 4:2:2	3G
			[ON]	1920×1080 50.00i 4:2:2	1.5G

* The horizontal effective pixels are converted from 2048 pixels to 1920 pixels to squeeze the image.

<MON OUT2> output

Output format is set in [MENU] → [SYSTEM SETTINGS] → [MON OUT].

The setting details of the status display and marker display are the same as the details for the <MON OUT1> terminal. Each can be set to be displayed or hidden.

- Output signal can be switched in [MENU] → [SYSTEM SETTINGS] → [MON OUT] → [MON OUT2 SIGNAL SEL].

  [MON OUT1]: The image (output image, etc.) becomes the same image as the output from the <MON OUT1> terminal.

  [VF]: The image (output image, marker, status, enlargement, etc.) becomes the same image as the output from the <VF SDI> terminal. Regardless of the [MON OUT] setting, LEVEL-A signal of 3G SDI is output from the <MON OUT2> terminal.

Output format list

[SYSTEM MODE]			[MON OUT]		Output Format	
[FREQUENCY]	**[PIXEL]**	**[MAIN CODEC]**	**[MON OUT2 SIGNAL SEL]**	**[1080p to 1080i]**	**Signal**	**Format**
[23.98p] [29.97p] [59.94p]	[4096×2160]	[AVC-Intra4K 422]	[MON OUT1]	[OFF]	2048×1080 59.94P 4:2:2	3G
				[ON]	1920×1080 59.94i 4:2:2	1.5G*
			[VF]	—	1920×1080 59.94P 4:2:2	3G
[25.00p] [50.00p]	[4096×2160]	[AVC-Intra4K 422]	[MON OUT1]	[OFF]	2048×1080 50.00P 4:2:2	3G
				[ON]	1920×1080 50.00i 4:2:2	1.5G*
			[VF]	—	1920×1080 50.00P 4:2:2	3G
[23.98p] [29.97p] [59.94p]	[3840×2160] [1920×1080]	[AVC-Intra4K 422] [AVC-Intra100]	[MON OUT1]	[OFF]	1920×1080 59.94P 4:2:2	3G
				[ON]	1920×1080 59.94i 4:2:2	1.5G
			[VF]	—	1920×1080 59.94P 4:2:2	3G
[25.00p] [50.00p]	[3840×2160] [1920×1080]	[AVC-Intra4K 422] [AVC-Intra100]	[MON OUT1]	[1080p]	1920×1080 50.00P 4:2:2	3G
				[1080i]	1920×1080 50.00i 4:2:2	1.5G
			[VF]	—	1920×1080 50.00P 4:2:2	3G

* The horizontal effective pixels are converted from 2048 pixels to 1920 pixels to squeeze the image.

<VF SDI> output

This output outputs the same image as the viewfinder display.
Output format is set in [MENU] → [VF SDI SETTINGS] → [VF SDI DISPLAY].
Status display is set in [MENU] → [VF SDI SETTINGS] → [INDICATOR].
Marker display is set in [MENU] → [VF SDI SETTINGS] → [MARKER].
Sets the surround view function in [MENU] → [VF SDI SETTINGS] → [SURROUND VIEW].
Sets the focus assist function in [MENU] → [VF SDI SETTINGS] → [ASSIST].
The setting details of the status display and marker display are the same as the details for the viewfinder.

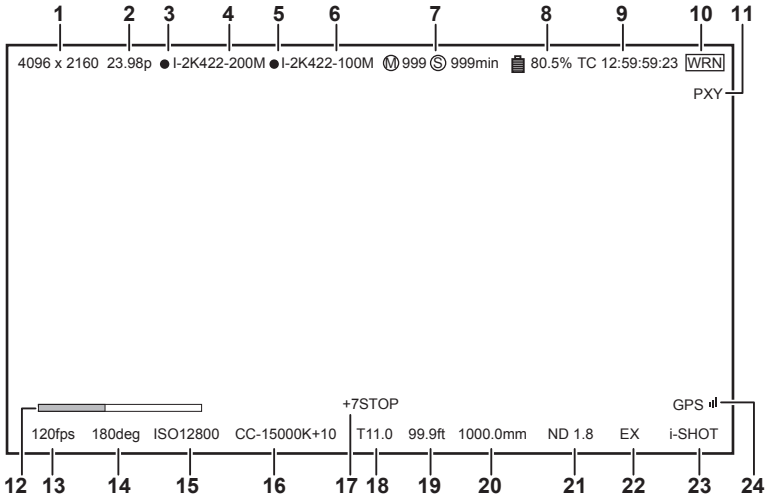
Output format list

[SYSTEM MODE]	[VF SDI DISPLAY]	Output Format	
[FREQUENCY]	[VF SDI 1080p to 1080i]	Signal	Format
[23.98p] [29.97p] [59.94p]	[OFF]	1920×1080 59.94P 4:2:2	3G*
	[ON]	1920×1080 59.94i 4:2:2	1.5G
[25.00p] [50.00p]	[OFF]	1920×1080 50.00P 4:2:2	3G*
	[ON]	1920×1080 50.00i 4:2:2	1.5G

* With 3G SDI output, LEVEL-A signal is output.

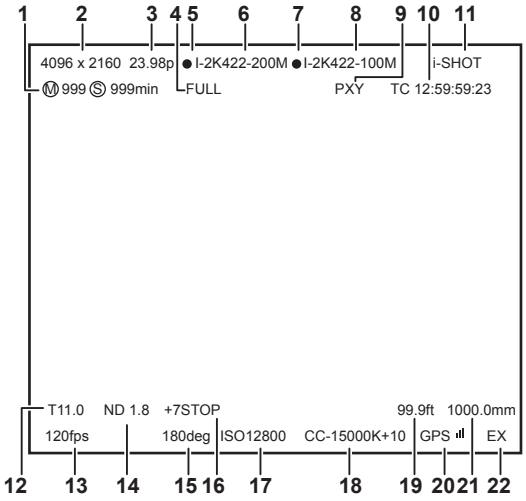
Screen status display

Status display (STATUS) in the <MON OUT1>, <MON OUT2>, and <VF SDI> outputs.



1 System pixel
2 System frequency
3 Main recorder recording status
4 Main codec
5 Sub recorder recording status
6 Sub codec
7 Card remaining free space
8 Battery charge level
9 Time code
10 Warning
11 Proxy
12 Focus bar (only output from <VF SDI> terminal)
13 FPS
14 Shutter
15 EXPOSURE INDEX
16 White balance
17 Y GET
18 Iris
19 Focus position
20 Zoom
21 ND filter
22 Extender
23 Recording mode (to be supported)
24 GPS status

Control panel status display (VIEW screen)



1 Card remaining free space
2 System pixel
3 System frequency
4 Battery charge level
5 Main recorder recording status
6 Main codec
7 Sub recorder recording status
8 Sub codec
9 Proxy
10 Time code
11 Recording mode (to be supported)
12 Iris
13 FPS
14 ND filter
15 Shutter
16 Y GET
17 EXPOSURE INDEX
18 White balance
19 Focus position
20 GPS status
21 Zoom
22 Extender

Chapter 9 Other Useful Functions

This chapter describes other useful features such as function buttons, etc.

Getting position information using the GPS

The camera has a built-in GPS. Positioning information can be recorded through GPS.

The GPS antenna is placed on top of the camera module.

When using the GPS function, do not cover the top of the camera module with metallic objects.

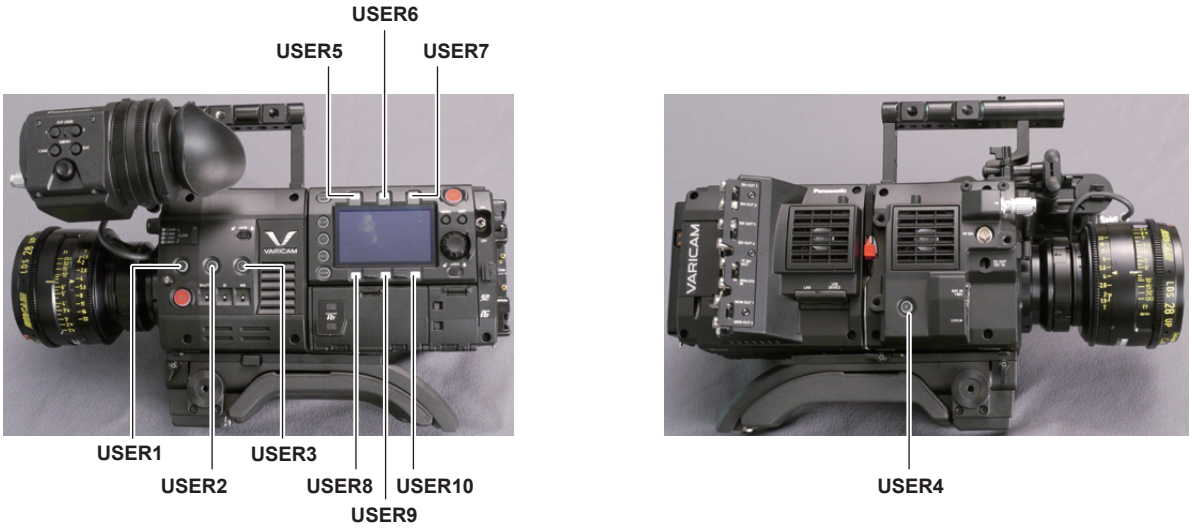
- [GPS] flashes in the viewfinder screen when positioning preparation is being performed.
- When positioning is complete, [GPS] lights up and GPS signal reception strength is indicated by 4-level bars.
- If the time is received using GPS, the time of the internal clock is maintained accurately based on the time received (Greenwich mean time) and the time zone.
- If the date and time display is different from the local time, the time zone setting may be incorrect. Recheck the time zone settings.

NOTE

- If it cannot position even after waiting several minutes, it means that the GPS signals are weak and difficult to receive.
- Position in the open space with a clear view of the sky.
- Detecting altitude may take more time than detecting latitude and longitude.
- The followings are locations where the signals from the GPS satellite cannot be properly received. Thus, you may not be able to position or you have large margin of errors.
  - Indoors
  - Near buildings or a canyon of buildings
  - In underground shopping areas
  - In forests
  - While moving in trains or automobiles
  - Inside tunnels

Assigning functions to the USER buttons

Selected functions can be assigned to the USER buttons <1> to <4> and the control panel operation buttons.
Set each function to be assigned to [USER1] to [USER10] in [MENU] → [SYSTEM SETTINGS] → [USER SWITCHS].
There are no functions assigned to the USER button in the factory settings.



Selectable functions

Item	Description
[INHIBIT]	Disables assignment of functions.
[SIX BUTTONS]	Sets against the USER <1> to <4> buttons, when the control panel operation button is used as the USER button.
[AWB]	Assigns the automatic white balance function.
[ABB]	Assigns the automatic black balance function.
[Y GET]	Assigns the function for displaying the luminance level of the image at the position indicated by the square marker displayed near the center.
[EXPAND]	Assigns the enlargement function.
[ASSIST]	Turns the advanced assist function on/off.
[WFM]	Enables/disables the viewfinder wave form display.
[BARS]	Assigns the color bars display function.
[FRAME LINE]	Displays/hides the frame line display function.
[VF COLOR]	Switches the viewfinder display to either monochrome or color display.
[MON1 COLOR]	Switches output images from the <MON OUT1> terminal.
[MON2 COLOR]	Switches output images from the <MON OUT2> terminal.
[SMOOTH MODE]	Assigns the smooth mode function.
[TEXT MEMO]	Assigns the text memo function.
[SHOT MARK]	Assigns the shot mark function.
[MAIN SLOT SEL]	Assigns the function for switching the card for recording when two or more cards are inserted in the main slot.
[SUB SLOT SEL]	Assigns the function for switching the card for recording when two or more cards are inserted in the sub slot.
[REC SW]	Assigns the function of the <REC> button.

NOTE

- Only the following functions can be assigned to [USER5] to [USER10].
  [INHIBIT], [EXPAND], [ASSIST], [FRAME LINE], [VF COLOR], [MON1 COLOR], [MON2 COLOR],[SMOOTH MODE]

Handling setting data

Handling SD memory cards

The SD memory card can be removed and inserted, either before or after the power is turned on.

Inserting SD memory cards

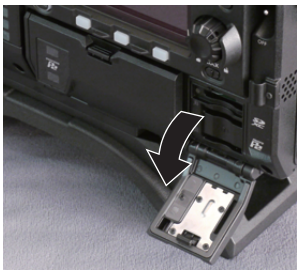


Fig. 1

Fig. 2

1 Open the slot cover. (Fig. 1)

2 Insert the SD memory card into the SD memory card slot with the label side of the card upward, and close the slot cover. (Fig. 2)

NOTE

- The SD memory card must be inserted with the correct side facing the SD card slot. If the SD memory card is hard to insert, it may be reversed or upside-down. Do not force it into the slot. Check the orientation of the card before reinserting it.
- Cautions when using SD memory cards
  - On the camera, use SD memory cards that conform to the SD standard, SDHC standard, or the SDXC standard.
  - MMC (Multi Media Card) cannot be used. (Bear in mind that taking pictures may no longer be possible if you use them.)
  - When using miniSD/microSD cards with the camera, always install the adaptor specially designed for miniSD/microSD cards. (The camera will not work properly if only the miniSD/microSD adaptor is installed. Make sure that the card has been inserted into the adaptor before use.)
  - Use of Panasonic SD memory cards and miniSD/microSD cards is recommended. Be sure to format cards on the camera before use.
  - Refer to our support desk at the following website for the latest information not included in this document.
    http://pro-av.panasonic.net/
  - SDHC memory cards are a standard that was established in 2006 by the SD Association for large-capacity memory cards that exceed 2 GB.
  - SDXC memory cards are a standard that was established in 2009 by the SD Association for large-capacity memory cards that exceed 32 GB.

Removing SD memory cards

After opening the slot cover and making sure that the busy lamp is not illuminated, push the SD memory card further into the camera and then release. This releases the SD memory card from the card slot. Remove the SD memory card and close the slot cover.

Note the following points when using or storing memory cards.

- Avoid high temperature and humidity.
- Avoid water droplets.
- Avoid charging with electricity.

Store the SD memory card with the card still inserted into the camera and with the slot cover closed.

Performing operations on SD memory cards

If the SD memory card that was formatted in a standard other than the SD/SDHC/SDXC standards on a device other than the camera is inserted, [LOAD] or [SAVE] operation of the file cannot be performed. Format the SD memory card again.

Formatting SD memory cards

1 From [MENU] → [SYSTEM SETTINGS] → [CARDS/MEDIA] → [FORMAT CARD], select [SD CARD], and press the jog dial button.

The confirmation screen is displayed.

2 Select [YES] on the confirmation screen, and press the jog dial button.

When not formatting, select [NO], and press the jog dial button.

3 When the completion message is displayed, select [OK], and press the jog dial button.

For details on error messages, refer to “During thumbnail and menu operation” (page 109).

NOTE

- Data deleted as a result of formatting cannot be restored. Always check the data before formatting.

Setting the time data

The camera provides time codes, user bits, and date and time (real time) data as time data, and they are recorded in the frame in sync with video. They are also recorded as data for clip metadata files.

Definition of time data

■ Time code

You can switch to [REC RUN] and [FREE RUN] with the control panel.

- **[FREE RUN]:** The time code always advances even when the power is turned off, and it can be handled in the same way as time. It can also be recorded slaved to the time code input to the <TC IN/OUT> terminal.
- **[REC RUN]:** Can be regenerated and recorded into the time code of clips recorded to P2 cards as a continuous value.

NOTE

- In the following case, the values are not continuous.
  - When deleting recorded clips
  - When switching to 24PN and 30PN (25PN)
  - When recording is interrupted due to a malfunction of [REC WARNING], etc. during recording.

■ User bits

Two types of user bits are built in.

- LTC UB: Recorded as LTC and output from the <TC IN/OUT> terminal. It is also output as LTC of the SDI signal.
- VITC UB: Recorded as VITC. It is also output as VITC of the SDI signal.

LTC UB can select and record user set values, time, year/month/day, the same value as time codes, camera frame rate information, and input value of external signals from the <TC IN/OUT> terminal, etc.

VITC UB records the camera frame rate information.

The LTC UB value of the recording start time can be recorded on the user bits of the clip metadata.

■ Duration (clip length) counter

This counter counts from 0 each time recording starts.The duration of the recorded clip is displayed after recording.

■ Date/time (real time)

- Based on the internal clock, year, month, day, and time can be displayed on the viewfinder/LCD monitor and on the image output from the <VF SDI> terminal, etc.
- The internal clock is used for measuring the free run time code while the power is off and as time and year/month/day data of the user bits. It is also used as the reference for file generation times during clip recording, which determine the sorting order of thumbnails and the order of playback.
- It is also used to generate clip metadata and UMID (Unique Material Identifier).

  For details, refer to “Setting the date/time of the internal clock” (page 31).

User bits settings

Sets the user bits to be recorded in the sub code area with the control panel.

Item	Description
[USER]	Records internal user values. The user value can be set from [MENU] → [REC SETTINGS] → [TC] → [SET UB], the user value can be set. Setting values are held even when the power is turned off. For details, refer to “How to input user bits” (page 77).
[TIME]	Records the time measured by the internal clock.
[DATE]	Records the hour digit of year/month/day/date-time measured by the internal clock.
[EXT INPUT]	Records the user bits values currently entered to the <TC IN/OUT> terminal.
[TCG]	Records the time code value.
[FRAME RATE]	Records the camera photo frame rate information. When playing back clips recorded in native format, the same frame rate information as VITC UB is output regardless of the recorded value. Use at this setting when the editing device such as a computer uses the frame rate information of the user bits.

How to input user bits

By setting user bits, information such as memos (date, time) up to eight digits long (hexadecimal) can be recorded.

1 Press the <TC> button to display the TC screen.

2 From the user bits display, select [User] in [UB MODE].

3 Select [SET].

The [TC SET] screen is displayed.

4 Set the user bits using the jog dial button.

5 Press the jog dial button to confirm the user bits setting value.

NOTE

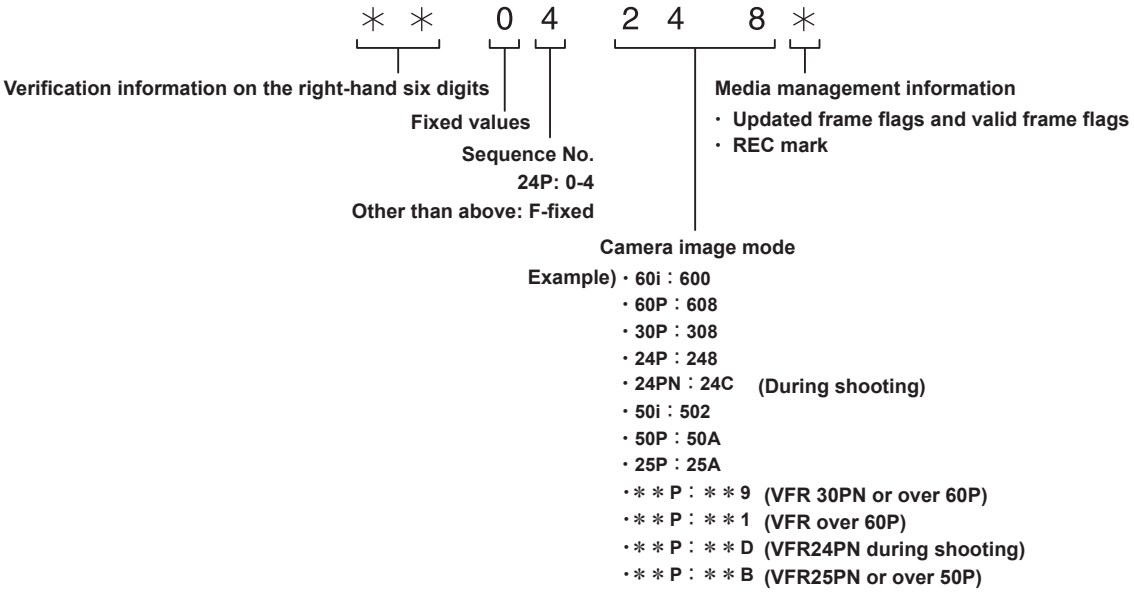
- If you exit the user bits setting screen without pressing the jog dial button, the set values will be disabled.

Retention of user bits in memory

User bit settings are automatically recorded and are retained even if the power is turned off.

Frame rate information

The relationship between frame rates, image pull-down, and time codes/user bits is as follows.



Setting the time code

1 Press the <TC> button to display the TC screen.

2 From the time code display, select [DF] or [NDF] in [DF/NDF].

Set [DF] to advance the time code in the drop frame mode, and set [NDF] to advance it in the non-drop frame mode. Note, however, that the time code always runs in [NDF] in the 24p (23.98P) mode.

3 Select [SET].

The [TC SET] screen is displayed.

4 Set the time code using the jog dial button.

5 Press the jog dial button to confirm the time code setting value.

Settable time code range

59.94P, 29.97P	00:00:00:00 to 23:59:59:29
23.98P	00:00:00:00 to 23:59:59:23
50P, 25P	00:00:00:00 to 23:59:59:24

NOTE

・ If you exit the time code setting screen without pressing the jog dial button, the set values will be disabled.

Time code function during battery replacement

Even during battery replacement, the backup mechanism functions, allowing the time code generator to continue operating.

When each item of the system mode has been changed, the time code of free run may shift. Turn on the power again, check the time code, and reset it, if necessary.

Time codes in variable frame rate

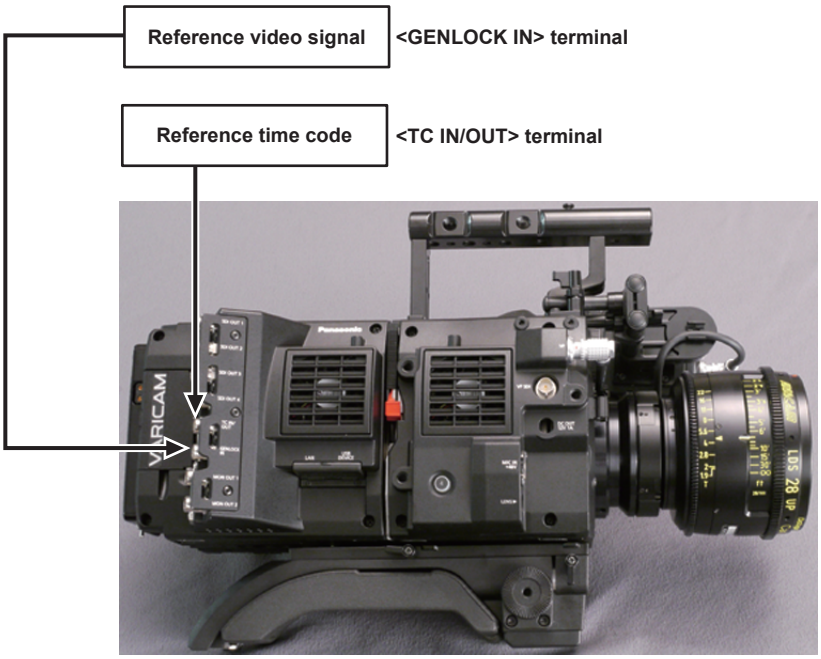
- In 24PN, recording is 24 frames, output is 30 frames, which matches 2:3 pull-down images.
- The advance rate of the recording and output time code matches real time only when the image frame rate is 24P. When 60P, recording advance rate is 60/24 times. In this case, the camera switches to [REC RUN] fixed operation and the time code value that is output when recording starts matches the recording time code.
- It is the same when shooting in modes other than 30P when in 30PN and shooting in modes other than 25P when in 25PN.

Externally locking the time code

The internal time code generator of the camera can be locked to an external generator.

Example of connections for external locking

As shown in the figure, connect both the reference video signal and the reference time code.



External lock operation procedure

To externally lock the time code, follow the steps below.

1 Press the <TC> button to display the TC screen.

2 From the time code display, select [Free Run] in [Free/Rec].

3 From [MENU] → [REC SETTINGS] → [TC] → [TC IN/OUT SEL], select [TC IN].

4 Enter the external time code from the <TC IN/OUT> terminal.

[SLAVE] is displayed on the TC screen.
The [TCG] characters on the HOME screen are displayed in black and white inversion.

- For the reference video signal, enter the SDI signal which is the same format as the system signal format ([FREQUENCY], [PIXEL]).
- When the system frequency is 59.94p or 50p, the time code may be out of sync by one field.
- When the input reference signal of generator lock is disrupted, recording cannot be performed normally. [TEMPORARY PAUSE IRREGULAR SIG] is displayed in the viewfinder screen, and the clip is divided. The synchronization with the time code is also not guaranteed. Recording will resume when the signal returns to normal.
- When the time code is externally locked, the time code is instantaneously locked to the external time code, the same value as the value of the external time code is output to the counter display area. Do not set to the recording mode for several seconds until the sync generator has stabilized. Furthermore, lock the time code to the <TC IN/OUT> terminal signal.
- If you execute the slave once, even if there is no longer <TC IN/OUT> terminal and <GENLOCK IN> terminal input, the slave status is maintained. However, in the following cases, the slave status will be released.
  - When [TC SET] is executed
  - When the power is turned off
  - When switched [DF]/[NDF]
  - When set to [Rec Run]
  - When a variable frame rate is applied
- The SDI input time code cannot be slave-locked (synchronized).
- If [EXT INPUT] is selected in [UB MODE] of the UB screen, regardless of the time code slave status, the user bits can be matched with the user bits input in the <TC IN/OUT> terminal. In this case, [UBG] characters are black and white inverted.

Cautions when switching the power supply from the battery to the external power supply while an external lock is active

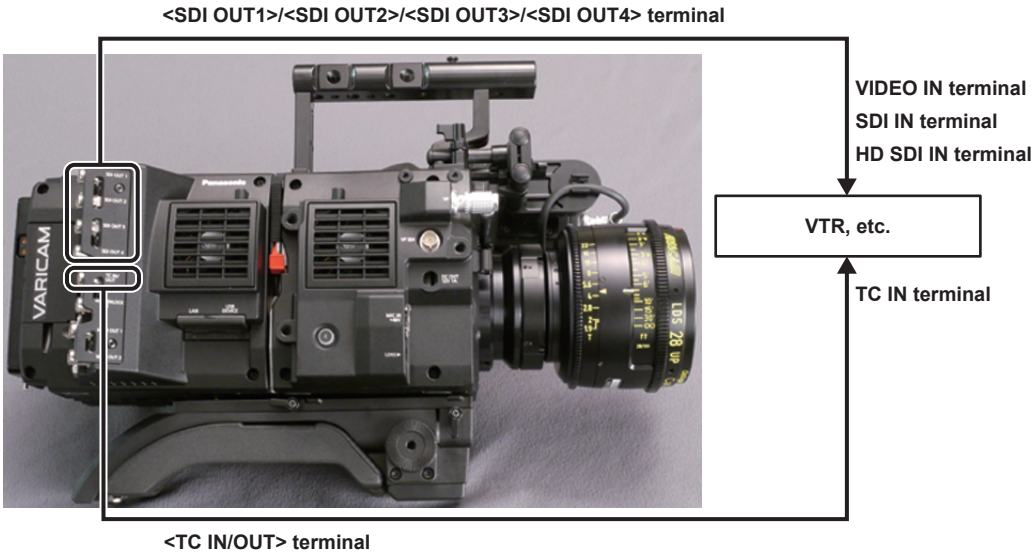
To keep on the time code generator power supply continuously, connect an external power supply to the <DC IN> terminal and then remove the battery pack. If the battery pack is removed first, there is no guarantee that the time code will stay externally locked.

Supplying the time code externally

You can supply the output time codes to an external recording device from the camera by matching the camera images or the replayed images.

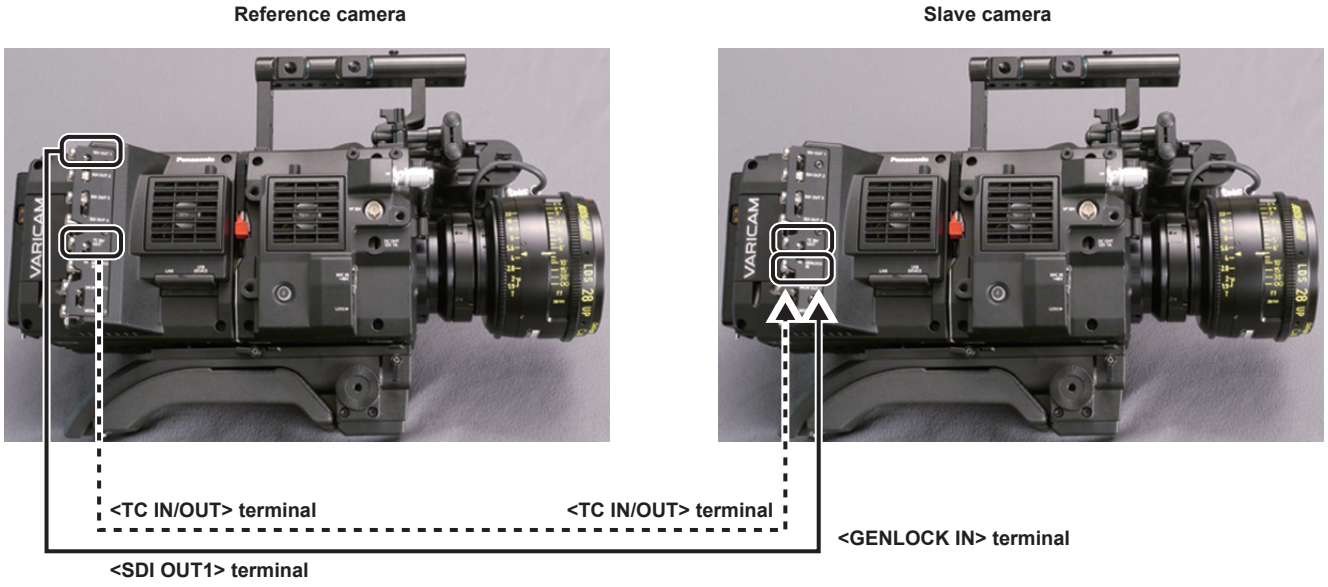
Connection example for supplying to external device

■ **When locking external devices to the camera**



■ **When two cameras are connected and one is used as a reference camera**

When using two cameras in which one is used as a reference camera to slave the time code, make the connection as follows.



NOTE

- Sets the <TC IN/OUT> terminal to output or input in [MENU] → [REC SETTINGS] → [TC] → [TC IN/OUT SEL].
- By setting [MENU] → [REC SETTINGS] → [TC] → [TC OUT REF] to [RECORDING] on both cameras, the two cameras will be able to record with the same time code on the video at the same time.

Operating procedure

1 From [MENU] → [REC SETTINGS] → [TC] → [TC IN/OUT SEL], set [TC OUT].

- To match the time code output from the <TC IN/OUT> terminal to the SDI output and monitor output image, set [MENU] → [REC SETTINGS] → [TC] → [TC OUT REF] to [SDI OUT].
- To output TCR during playback, set [MENU] → [REC SETTINGS] → [TC] → [TC OUT] to [TCG/TCR].
  These settings are not required, if the internal device uses LTC or VITC output multiplexed to the SDI output.

Chapter 10 Menu Operations

This chapter describes how to operate the camera menus, the structure, and details of the setting menu.

Setting menu structure

Menu configuration

The setting menu is configured as follows.

[SYSTEM SETTINGS]	Sets the system in general. Set the system frequency, the number of lines, recording format, and recording method.
[CAMERA SETTINGS]	Sets the fine quality adjustment of camera videos and sets camera operation. This item is also handled as a scene file. There are a limited number of fine image quality adjustment items in the factory settings. If [MENU] → [CAMERA SETTINGS] → [Enhanced] → [Enhanced SW] is set to [ON], operation of all items can be performed.
[REC SETTINGS]	The various setting items of the recording function of the camera.
[VF SDI SETTINGS]	Sets the display content of the output video from the viewfinder and <VF SDI> terminal.
[FILE]	Performs file-related operations such as reading/writing menu settings data from/to an SD memory card, and handling lens files and lens chromatic aberration correction (CAC) files. This item will be available in future version upgrade.
[PERIPHERAL]	Applies settings related to functions used in conjunction with peripheral devices, such as network and GPS devices. Network functions will be supported in future versions.

[Enhanced] menu

The camera has an extended ([Enhanced]) menu that can be used to perform fine image quality adjustment for camera videos.

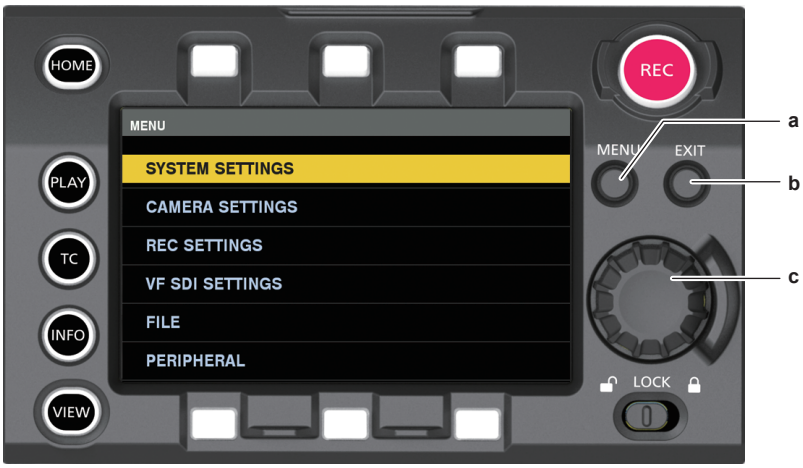
The extended menu is not displayed by default in the factory settings. To display extended menu items, set [MENU] → [CAMERA SETTINGS] → [Enhanced] → [Enhanced SW] to [ON].

The presence of items marked with ENHANCED in the menu list indicates that you are viewing the extended menu.

Setting menu display

Setting menu basic operations

You can change camera settings using the setting menu according to the shooting scene and recording details.
Set data are written and saved in the internal memory of the camera.



a: <MENU> button

b: <EXIT> button

c: Jog dial button

1 Press the <MENU> button when not recording.

- The [MENU] screen is displayed on the control panel.

2 Turn the jog dial button to place the cursor on the desired menu item.

- Turn the jog dial button to move the cursor vertically.

3 Press the jog dial button.

- The next level of screen is displayed.
  If there is another level, press the jog dial button again to display it.
- The current setting value of the item selected on the right is displayed.

4 Turn the jog dial button to place the cursor on the desired item.

5 Press the jog dial button.

The item is in the setting status.
If there are two items, the setting value selection frame may be displayed on the right.

6 Turn the jog dial button to place the cursor on the desired item.

7 Press the jog dial button.

Setting is completed.

8 Press the <EXIT> button to close the menu.

Setting menu initialization

The values set in the setting menu can be reset to the factory setting.

1 Select [LOAD FACTORY DATA] from [MENU] → [SYSTEM SETTINGS] → [INITIALIZE].

[MENU] setting values are reset to factory settings.

Menu list

[SYSTEM SETTINGS]

Sets the system in general.

• ENHANCED is the extended menu. Set [MENU] → [CAMERA SETTINGS] → [Enhanced] → [Enhanced SW] to [ON] to display the extended menu.

Item		Description of settings
[SYSTEM MODE]	[FREQUENCY]	Sets the system frequency. If the setting of this item is changed, the device must be restarted. If a restart is required, a confirmation dialog will be shown. The camera's system operation are determined by three settings: [FREQUENCY], [PIXEL], and [MAIN CODEC]. Check to see if the three settings are matched. **[23.98p], [25.00p], [29.97p], [50.00p], [59.94p]** • Factory setting: [23.98p]
	[PIXEL]	Sets the main recorder's number of recording pixels. **[4096×2160], [3840×2160], [1920×1080]** • Factory setting: [4096×2160]
	[MAIN CODEC]	Sets the main recorder's recording codec. Selectable items vary depending on the [FREQUENCY]/[PIXEL] setting. **[AVC-Intra4K 422], [AVC-Intra100]** • Factory setting: [AVC-Intra4K 422]
	[SUB CODEC]	Sets the sub recorder's recording codec. Selectable items vary depending on the [FREQUENCY]/[PIXEL] setting. At the same time, this enables/disables proxy data recording. **[AVC-Intra2K 422], [AVC-Intra100], [AVC-LongG50], [AVC-LongG25], [AVC-Intra2K 422 & Pxy], [AVC-Intra100 & Pxy], [AVC-LongG50 & Pxy], [AVC-LongG25 & Pxy], [OFF]** • Factory setting: [AVC-Intra2K 422]
[COLOR SETTING]	[MAIN]	Sets the colors of videos (entire camera system) recorded in the main recorder. **[V-Log]/[V-709]/[3D LUT]** • Factory setting: [V-Log]
	[GRADING]	Sets whether to apply the grading process. This only enabled when [V-Log] is set in [MAIN]. **[ON], [OFF]** • Factory setting: [OFF]
	[SUB]	Sets the colors of videos (entire camera system) recorded in the sub recorder. Selectable items vary depending on the [MAIN] setting. When [MAIN] is set to [V-Log] and [GRADING] is set to [ON] **[V-Log]/[GRADING]** When [MAIN] is set to [V-Log] and [GRADING] is set to [OFF] **[V-Log]/[V-709]** When [MAIN] is set to [V-709] **[V-709]** When [MAIN] is set to [3D LUT] **[3D LUT]** • Factory setting: [V-Log]
	[3D LUT]	Sets the grading process method when [GRADING] is set to [ON]. When [GRADING] is set to [ON] **[OFF]/[V-709]/[LOADED FILE]/[FILE SEL]** When [GRADING] is set to [OFF] **[OFF]** • Factory setting: [OFF]
	[CDL]	Sets the grading process method when [GRADING] is set to [ON]. When [GRADING] is set to [ON] **[ON], [OFF]** When [GRADING] is set to [OFF] **[OFF]** • Factory setting: [OFF]
	[MON 1]	Sets the output image from the <MON OUT1> terminal. Selectable items vary depending on the [MAIN] setting. When [MAIN] is set to [V-Log] and [GRADING] is set to [ON] **[V-Log]/[GRADING]** When [MAIN] is set to [V-Log] and [GRADING] is set to [OFF] **[V-Log]/[V-709]** When [MAIN] is set to [V-709] **[V-709]** When [MAIN] is set to [3D LUT] **[3D LUT]** • Factory setting: [V-Log]

Item		Description of settings
	[MON 2]	Sets the output image from the <MON OUT2> terminal. Selectable items vary depending on the [MAIN] setting. When [MAIN] is set to [V-Log] and [GRADING] is set to [ON] **[V-Log]/[GRADING]** When [MAIN] is set to [V-Log] and [GRADING] is set to [OFF] **[V-Log]/[V-709]** When [MAIN] is set to [V-709] **[V-709]** When [MAIN] is set to [3D LUT] **[3D LUT]** • Factory setting: [V-Log]
	[VF]	Sets the output image from the <VF> terminal and the <VF SDI> terminal. Selectable items vary depending on the [MAIN] setting. When [MAIN] is set to [V-Log] and [GRADING] is set to [ON] **[V-Log]/[GRADING]/[V-709]/[LCC]** When [MAIN] is set to [V-Log] and [GRADING] is set to [OFF] **[V-Log]/[V-709]/[LCC]** When [MAIN] is set to [V-709] **[V-709]** When [MAIN] is set to [3D LUT] **[3D LUT]** • Factory setting: [V-Log]
[AUDIO INPUT]	[AES/EBU IN]	If this is set to [ON], the digital audio (AES/EBU standard-compliant) input from the <AUDIO IN 1> terminal and <AUDIO IN 2> terminal is recorded in 4 channels. In this case, analog input selection and volume adjustment is not possible. **[ON], [OFF]** • Factory setting: [OFF]
	[FRONT MIC POWER]	Enables/disables the front microphone phantom power. **[ON], [OFF]** • Factory setting: [ON]
	[FRONT MIC LEVEL]	Sets the front microphone input level. **[–40dB], [–50dB]** • Factory setting: [–40dB]
	[REAR1 MIC POWER]	Enables/disables the phantom power of the rear microphone connected to the <AUDIO IN 1> terminal. **[ON], [OFF]** • Factory setting: [OFF]
	[REAR2 MIC POWER]	Enables/disables the phantom power of the rear microphone connected to the <AUDIO IN 2> terminal. **[ON], [OFF]** • Factory setting: [OFF]
	[REAR MIC LEVEL]	Sets the input level of the rear microphone connected to the <AUDIO IN 1> and <AUDIO IN 2> terminals. **[–40dB], [–50dB], [–60dB]** • Factory setting: [–60dB]
	[REAR LINE LEVEL]	Sets the line input level from the <AUDIO IN 1> terminal and <AUDIO IN 2> terminal. **[4dB], [0dB], [–3dB]** • Factory setting: [4dB]
	[FRONT1 MIC LOWCUT]	Enables/disables the low-cut filter of front microphone 1. **[ON], [OFF]** • Factory setting: [OFF]
	[FRONT2 MIC LOWCUT]	Enables/disables the low-cut filter of front microphone 2. **[ON], [OFF]** • Factory setting: [OFF]
	[REAR1 MIC LOWCUT]	Enables/disables the low-cut filter of rear microphone 1. **[ON], [OFF]** • Factory setting: [OFF]
	[REAR2 MIC LOWCUT]	Enables/disables the low-cut filter of rear microphone 2. **[ON], [OFF]** • Factory setting: [OFF]
	[CH IN SEL]	Sets the input of audio channels 1 to 4. **[1·2FRONT 3·4REAR], [1·2REAR 3·4FRONT]** • Factory setting: [1·2FRONT 3·4REAR]
	[TEST TONE]	Sets whether to output a test signal when the video is made to a color bar. **[ON]:** Outputs a test tone. **[OFF]:** Does not output a test tone. • Factory setting: [ON]
[AUDIO LEVEL]	[FRONT1 LEVEL]	Sets the level adjustment method of the front microphone 1 to manual or automatic. **[AUTO]:** Adjust automatically. **[MANUAL]:** Enables manual adjustment. • Factory setting: [AUTO]
	[FRONT2 LEVEL]	Sets the level adjustment method of the front microphone 2 to manual or automatic. **[AUTO]:** Adjust automatically. **[MANUAL]:** Enables manual adjustment. • Factory setting: [AUTO]
	[REAR1 LEVEL]	Sets the level adjustment method of the rear microphone 1 to manual or automatic. **[AUTO]:** Adjust automatically. **[MANUAL]:** Enables manual adjustment. • Factory setting: [AUTO]

Item		Description of settings
	[REAR2 LEVEL]	Sets the level adjustment method of the rear microphone 2 to manual or automatic. **[AUTO]:** Adjust automatically. **[MANUAL]:** Enables manual adjustment. • Factory setting: [AUTO]
	[FRONT1 VR]	Performs adjustments in this item when the level adjustment method of the front microphone 1 is set to [MANUAL]. **[0]…[100]** • Factory setting: [70]
	[FRONT2 VR]	Performs adjustments in this item when the level adjustment method of the front microphone 2 is set to [MANUAL]. **[0]…[100]** • Factory setting: [70]
	[REAR1 VR]	Performs adjustments in this item when the level adjustment method of the rear microphone 1 is set to [MANUAL]. **[0]…[100]** • Factory setting: [70]
	[REAR2 VR]	Performs adjustments in this item when the level adjustment method of the rear microphone 2 is set to [MANUAL]. **[0]…[100]** • Factory setting: [70]
	[FRONT1 LIMITER]	Enables/disables the limiter of front microphone 1. **[ON], [OFF]** • Factory setting: [OFF]
	[FRONT2 LIMITER]	Enables/disables the limiter of front microphone 2. **[ON], [OFF]** • Factory setting: [OFF]
	[REAR1 LIMITER]	Enables/disables the limiter of rear microphone 1. **[ON], [OFF]** • Factory setting: [OFF]
	[REAR2 LIMITER]	Enables/disables the limiter of rear microphone 2. **[ON], [OFF]** • Factory setting: [OFF]
	[HEADROOM]	Sets the headroom (standard level). **[18dB], [20dB]** • Factory setting: [20dB]
[AUDIO OUTPUT]	[MONITOR SEL1]	Sets the audio channel to be output from the <PHONES> terminal. **[CH1/2]:** Outputs audio channel 1/2. **[CH3/4]:** Outputs audio channel 3/4. • Factory setting: [CH1/2]
	[MONITOR SEL2]	Sets the audio format (mono, stereo, mix) to be output from the <PHONES> terminal. When [MONITOR SEL1] is set to [CH1/2]: **[MONO CH1], [MONO CH2], [STEREO CH1/2], [MIX CH1/2]** When [MONITOR SEL1] is set to [CH3/4]: **[MONO CH3], [MONO CH4], [STEREO CH3/4], [MIX CH3/4]** • Factory setting: [STEREO CH1/2] or [STEREO CH3/4]
	[MONITOR DELAY]	Sets whether to delay the audio from the <PHONES> terminal to match the monitor output. **[ON], [OFF]** • Factory setting: [OFF]
	[MONITOR VR]	Adjusts the level of audio to be output from the <PHONES> terminal. **[0]…[100]** • Factory setting: [70]
	[ALARM]	Sets the volume of the warning sound to be output from the <PHONES> terminal. **[LOUD], [MIDIUM], [SMALL], [OFF]** • Factory setting: [MIDIUM]
[CONTROL DISPLAY]	[BRIGHTNESS]	Adjusts the brightness of the control panel. **[−15]…[15]** • Factory setting: [0]
	[COLOR LEVEL]	Adjusts the color levels of the control panel. **[−15]…[15]** • Factory setting: [0]
	[CONTRAST]	Adjusts the contrast of the control panel. **[−30]…[30]** • Factory setting: [0]
	[BACK LIGHT]	Sets the brightness of the control panel backlight. **[−1]:** Darkens the display more than normal. **[0]:** Normal brightness. **[1]:** Brightens the display more than normal. • Factory setting: [0]
	[BUTTON LED]	Illuminates each button of the control panel and camera module. **[ON], [OFF]** • Factory setting: [ON]
	[STATUS]	Press the <VIEW> button to set whether to show the status display when a camera video is displayed on the control panel. **[ON], [OFF]** • Factory setting: [ON]

Item		Description of settings
[SDI OUT]	[P to PsF]	Sets the segment frame for the output from terminals <SDI OUT1> to <SDI OUT4>. This is enabled only when both of the following items are set. • When [MENU] → [SYSTEM SETTINGS] → [SYSTEM MODE] → [FREQUENCY] is set to [29.97p], [23.98p], or [25.00p]. • When [MENU] → [SYSTEM SETTINGS] → [SYSTEM MODE] → [PIXEL] is set to [1920×1080]. **[ON], [OFF]** • Factory setting: [OFF]
	[4K OUT TYPE]	Sets the 4K signal format to be output from terminals <SDI OUT1> to <SDI OUT4>. **[SQUARE], [2 SAMPLE INT]** • Factory setting: [SQUARE]
	[3G-SDI OUT]	Sets the 3G SDI signal format to be output from terminals <SDI OUT1> to <SDI OUT4>. **[LEVEL-A]:** Selects the LEVEL-A method. **[LEVEL-B]:** Selects the LEVEL-B DL method. • Factory setting: [LEVEL-B]
	[SDI REC REMOTE]	Sets whether to use the control function of recording operation for an external device (such as a recorder) connected to the <SDI OUT> terminal. **[ON]:** Controls the recording operation of the external device. **[OFF]:** Does not control the recording operation of the external device. • Factory setting: [OFF]
[MON OUT]	[1080p to 1080i]	Selects whether to convert the output signal from the <MON OUT1> terminal and <MON OUT2> terminal to 1080i when in 1080P mode. **[ON], [OFF]** • Factory setting: [OFF]
	[3G-SDI OUT]	Sets the 3G SDI signal format to be output from the <MON OUT1> terminal and <MON OUT2> terminal. **[LEVEL-A]:** Selects the LEVEL-A method. **[LEVEL-B]:** Selects the LEVEL-B DL method. • Factory setting: [LEVEL-B]
	[MON OUT2 SIGNAL SEL]	Sets the output from the <MON OUT2> terminal. **[VF]:** Selects the same output as the <VF SDI> terminal. **[MON OUT1]:** Selects the same output as the <MON OUT1> terminal. • Factory setting: [VF]
	[MON OUT1 STATUS]	Sets whether to show the status display on the output from the <MON OUT1> terminal. **[ON], [OFF]** • Factory setting: [OFF]
	[MON OUT2 STATUS]	Sets whether to show the status display on the output from the <MON OUT2> terminal. **[ON], [OFF]** • Factory setting: [OFF]
	[MENU DISP]	Sets whether to display [MENU] in the output from the <MON OUT1> terminal and <MON OUT2> terminal. **[ON], [OFF]** • Factory setting: [ON]
[MON OUT INDICATOR]	[SYSTEM PIXEL]	Displays/hides system pixels. **[ON], [OFF]** • Factory setting: [ON]
	[SYSTEM FREQ]	Displays/hides system frequency. **[ON], [OFF]** • Factory setting: [ON]
	[REC FORMAT]	Displays/hides recording format display. **[ON], [OFF]** • Factory setting: [ON]
	[FPS]	Displays/hides frame rate. **[ON], [OFF]** • Factory setting: [ON]
	[SHUTTER]	Displays/hides shutter speed. **[ON], [OFF]** • Factory setting: [ON]
	[EI]	Displays/hides EXPOSURE INDEX. **[ON], [OFF]** • Factory setting: [ON]
	[WHITE]	Displays/hides color temperature. **[ON], [OFF]** • Factory setting: [ON]
	[IRIS]	Displays/hides iris value. **[ON], [OFF]** • Factory setting: [ON]
	[FOCUS]	Displays/hides focus distance. **[ON], [OFF]** • Factory setting: [ON]
	[ZOOM]	Displays/hides zoom value. **[ON], [OFF]** • Factory setting: [ON]
	[FILTER]	Displays/hides the optical filter transmittance. **[ON], [OFF]** • Factory setting: [ON]

Item		Description of settings
	[EXTENDER]	Displays/hides the extender. **[ON], [OFF]** • Factory setting: [ON]
	[Y GET]	Displays/hides brightness of Y GET. **[ON], [OFF]** • Factory setting: [ON]
	[TC]	Displays/hides the time code, user bits, and duration counter displays. **[TCG/TCR], [TCG], [OFF]** • Factory setting: [TCG/TCR]
	[P2 CARD REMAIN]	Displays/hides the display of the remaining recording free space of a P2 card. **[ON], [OFF]** • Factory setting: [ON]
	[BATTERY REMAIN]	Displays/hides the estimated remaining battery charge level. **[ON], [OFF]** • Factory setting: [ON]
	[PROXY]	Displays/hides proxy information. **[ON], [OFF]** • Factory setting: [ON]
	[GPS]	Displays/hides GPS signal reception status. **[ON], [OFF]** • Factory setting: [ON]
[MON OUT MARKER]	[MON OUT1 SW]	Displays/hides markers for the output from the <MON OUT1>. **[ON], [OFF]** • Factory setting: [OFF]
	[MON OUT2 SW]	Displays/hides markers for the output from the <MON OUT2>. **[ON], [OFF]** • Factory setting: [ON]
	[LCD SW]	Displays/hides markers for the control panel. **[ON], [OFF]** • Factory setting: [ON]
	[CENTER MARKER]	Controls the center mark. **[1]:** + (large) **[2]:** Open center (large) **[3]:** + (small) **[4]:** Open center (small) **[OFF]:** Does not display. • Factory setting: [1]
	[SAFETY MARKER]	Selects the type of frame for the safety zone marker. **[1]:** Box **[2]:** Corners **[OFF]:** Does not display. Factory setting: [OFF]
	[SAFETY AREA]	Sets the size of the safety zone marker. **[80%] - [100%]** (1% step, fixed aspect ratio) • Factory setting: [90%]
	[FRAME MARK]	Enables/disables frame marker. **[ON], [OFF]** • Factory setting: [OFF]
	[FRAME SIG]	Sets frame marker aspect ratio. **[1.33:1], [1.44:1], [1.56:1], [1.78:1], [1.85:1], [2.35:1]** • Factory setting: [2.35:1]
	[FRAME LEVEL]	Sets the level of the outside of the frame marker. **[0%] - [100%]** (10% step) • Factory setting: [100%]
	[MARKER & CHAR LVL]	Sets the marker and character luminance. **[50%]…[100%] (10% step)** • Factory setting: [70%]
	[USER BOX]	Displays/hides the user box. **[ON], [OFF]** • Factory setting: [OFF]
	[USER BOX WIDTH]	Sets the width of the user box. **[1]…[100]** • Factory setting: [13]
	[USER BOX HEIGHT]	Sets the height of the user box. **[1]…[100]** • Factory setting: [13]
	[USER BOX H POS]	Sets the horizontal position of the center of the user box. **[−50]…[50]** • Factory setting: [0]
	[USER BOX V POS]	Sets the vertical position of the center of the user box. **[−50]…[50]** • Factory setting: [0]

Item		Description of settings
[GENLOCK]	[GENLOCK MODE]	Switches the synchronization signal of the camera signal. **[INT]:** Synchronizes to the internal standard signal. **[EXT]:** Synchronizes to the entered external standard signal. • Factory setting: [INT]
	[H PHASE COARSE]	Roughly adjusts to match horizontal synchronization phase when building a system. **[–100]…[100]** • Factory setting: [0]
	[H PHASE FINE]	Minutely adjusts to match horizontal synchronization phase when building a system. **[–100]…[100]** • Factory setting: [0]
[INFORMATION]	[OPERATION TIME]	Displays the operation time of the camera.
	[VERSION]	Displays the information of the camera. **[VERSION]:** Displays the version. **[MODEL NAME]:** Displays the product name. **[SERIAL NO.]:** Displays the serial number.
	[UPDATE]	Performs an update of the camera firmware. (Enabled only when there is a dedicated update file on the SD memory card.)
	[ONLINE SUPPORT]	Switches the camera to the PASS (P2 Asset Support System) function mode.
	[TRACE LOG]	Reads the camera's execution log from an SD memory card.
	[SENSOR TEMP]	Displays the ambient temperature detected by the camera module's sensor.
	[FAN]	Sets the fan operation status. **[AUTO]:** Controls the number of rotations according to the operation mode of the unit. **[ON]:** Always rotates at high speed. • Factory setting: [ON]
[CARDS/MEDIA]	[CPS PASSWORD]	Sets the CPS encryption password for the expressP2 memory card and the microP2 memory card. **[LOAD]:** Loads CPS password from an SD memory card. **[SET]:** Enters the CPS password. **[DELETE]:** Deletes the password saved to the device, and disables encrypted formats.
	[FORMAT CARD]	Formats the card in the specified slot after the format menu is selected. **[MAIN SLOT1], [MAIN SLOT2], [SUB SLOT3], [SUB SLOT4], [SD CARD]** When a CPS password is set, you can select [NORMAL] (normal unencrypted format) or [CPS(ENCRYPT)] (encrypted format). Data deleted as a result of formatting cannot be restored. Always check the data before formatting.
	[MEDIA END ALARM]	Sets whether to generate an alarm sound when there is no remaining free space in the expressP2 memory card or the microP2 memory card. **[ON], [OFF]** • Factory setting: [ON]
[USER SWITCHS]	[USER1]	Sets the function to be assigned to the USER <1> button. **[INHIBIT], [SIX BUTTONS], [AWB], [ABB], [Y GET], [EXPAND], [ASSIST], [WFM], [BARS], [FRAME LINE], [VF COLOR], [MON1 COLOR], [MON2 COLOR], [SMOOTH MODE], [TEXT MEMO], [SHOT MARK], [MAIN SLOT SEL], [SUB SLOT SEL], [REC SW]** • Factory setting: [INHIBIT]
	[USER2]	Sets the function to be assigned to the USER <2> button. **[INHIBIT], [SIX BUTTONS], [AWB], [ABB], [Y GET], [EXPAND], [ASSIST], [WFM], [BARS], [FRAME LINE], [VF COLOR], [MON1 COLOR], [MON2 COLOR], [SMOOTH MODE], [TEXT MEMO], [SHOT MARK], [MAIN SLOT SEL], [SUB SLOT SEL], [REC SW]** • Factory setting: [INHIBIT]
	[USER3]	Sets the function to be assigned to the USER <3> button. **[INHIBIT], [SIX BUTTONS], [AWB], [ABB], [Y GET], [EXPAND], [ASSIST], [WFM], [BARS], [FRAME LINE], [VF COLOR], [MON1 COLOR], [MON2 COLOR], [SMOOTH MODE], [TEXT MEMO], [SHOT MARK], [MAIN SLOT SEL], [SUB SLOT SEL], [REC SW]** • Factory setting: [INHIBIT]
	[USER4]	Sets the function to be assigned to the USER <4> button. **[INHIBIT], [SIX BUTTONS], [AWB], [ABB], [Y GET], [EXPAND], [ASSIST], [WFM], [BARS], [FRAME LINE], [VF COLOR], [MON1 COLOR], [MON2 COLOR], [SMOOTH MODE], [TEXT MEMO], [SHOT MARK], [MAIN SLOT SEL], [SUB SLOT SEL], [REC SW]** • Factory setting: [INHIBIT]
	[USER5]	Sets the function to be assigned to the control panel operation button. The control panel operation button functions as a USER button. Assign [SIX BUTTONS] to USER buttons <1> to <4>. **[INHIBIT], [EXPAND], [ASSIST], [FRAME LINE], [VF COLOR], [MON1 COLOR], [MON2 COLOR], [SMOOTH MODE]** • Factory setting: [INHIBIT]
	[USER6]	Sets the function to be assigned to the control panel operation button. The control panel operation button functions as a USER button. Assign [SIX BUTTONS] to USER buttons <1> to <4>. **[INHIBIT], [EXPAND], [ASSIST], [FRAME LINE], [VF COLOR], [MON1 COLOR], [MON2 COLOR], [SMOOTH MODE]** • Factory setting: [INHIBIT]

Item		Description of settings
	[USER7]	Sets the function to be assigned to the control panel operation button. The control panel operation button functions as a USER button. Assign [SIX BUTTONS] to USER buttons <1> to <4>. **[INHIBIT], [EXPAND], [ASSIST], [FRAME LINE], [VF COLOR], [MON1 COLOR], [MON2 COLOR], [SMOOTH MODE]** • Factory setting: [INHIBIT]
	[USER8]	Sets the function to be assigned to the control panel operation button. The control panel operation button functions as a USER button. Assign [SIX BUTTONS] to USER buttons <1> to <4>. **[INHIBIT], [EXPAND], [ASSIST], [FRAME LINE], [VF COLOR], [MON1 COLOR], [MON2 COLOR], [SMOOTH MODE]** • Factory setting: [INHIBIT]
	[USER9]	Sets the function to be assigned to the control panel operation button. The control panel operation button functions as a USER button. Assign [SIX BUTTONS] to USER buttons <1> to <4>. **[INHIBIT], [EXPAND], [ASSIST], [FRAME LINE], [VF COLOR], [MON1 COLOR], [MON2 COLOR], [SMOOTH MODE]** • Factory setting: [INHIBIT]
	[USER10]	Sets the function to be assigned to the control panel operation button. The control panel operation button functions as a USER button. Assign [SIX BUTTONS] to USER buttons <1> to <4>. **[INHIBIT], [EXPAND], [ASSIST], [FRAME LINE], [VF COLOR], [MON1 COLOR], [MON2 COLOR], [SMOOTH MODE]** • Factory setting: [INHIBIT]
[BATTERY]	[BATTERY SELECT]	Selected according to the battery used. **[DIONIC], [HyTRON], [ENDURA], [PAG]:** The remaining charge level is detected and a warning is displayed according to the [NEAR END Info] and [END Info] settings. When there is no remaining charge level information, the remaining charge level is detected from the voltage level. **[other]:** Remaining charge level is detected from the voltage level. • Factory setting: [DIONIC]
	[EXT DC IN SELECT]	Sets the type of the external power supply input into the <DC IN> terminal. **[DC POWER SUPPLY]:** Selected when connecting an AC adaptor. In this case, the remaining battery charge level is not displayed. **[BATTERY]:** Selected when connecting a battery to the <DC IN> terminal. Remaining charge level is detected from the voltage level. • Factory setting: [DC POWER SUPPLY]
	[FULL Volt]	Sets the voltage in the remaining charge level full display when the battery remaining charge level is detected from the voltage level. **[13.0V] - [17.0V]** (0.1 V step) • Factory setting: [15.5V]
	[NEAR END Volt]	Sets the remaining charge level near end voltage when the battery remaining charge level is detected from the voltage level. **[11.0V] - [15.0V]** (0.1 V step) • The maximum value is the value set in [FULL Volt]. (However, the maximum is [15.0V]) • Factory setting: [13.2V]
	[END Volt]	Sets the remaining charge level end voltage when the battery remaining charge level is detected from the voltage level. **[11.0V] - [15.0V]** (0.1 V step) • The maximum value is the value set in [NEAR END Volt]. • Factory setting: [12.5V]
	[NEAR END Info]	Sets the percentage value of the remaining charge level near end when remaining charge level information is acquired from the battery. **[4%], [5%], [6%], [7%], [8%], [9%], [10%], [12%], [14%], [16%], [18%], [20%]** • Factory setting: [5%]
	[END Info]	Sets the percentage value of the remaining charge level end when remaining charge level information is acquired from the battery. **[1%] - [10%]** (1% step) • The maximum value is the value set in [NEAR END Info]. (However, the maximum is [10%]) • Factory setting: [1%]
	[EXT DC FULL]	Sets the voltage to be displayed in the remaining charge level full display when an external power supply is input from the <DC IN>. **[13.0V] - [17.0V]** (0.1 V step) • Factory setting: [15.5V]
	[EXT DC NEAR END]	Sets the remaining charge level near end voltage when an external power supply is input from the <DC IN>. **[11.0V] - [15.0V]** (0.1 V step) • The maximum value is the value set in [EXT DC FULL]. (However, the maximum is [15.0V]) • Factory setting: [13.2V]
	[EXT DC END]	Sets the remaining charge level end voltage when an external power supply is input from the <DC IN>. **[11.0V] - [15.0V]** (0.1 V step) • The maximum value is the value set in [EXT DC NEAR END]. • Factory setting: [12.5V]
	[END ALARM]	Sets whether to sound an alarm at battery remaining charge level end. **[ON], [OFF]** • Factory setting: [ON]

Item		Description of settings
[CLOCK]	[CLOCK SETTING]	Sets the built-in calendar (year/month/day) and time. **[YEAR]:** [2014] - [2037] **[MONTH]:** [JAN]…[DEC] ([1]…[12]) **[DAY]:** [1] - [31] ([28], [29], [30]) **[HOUR]:** [0] - [23] **[MINUTE]:** [0] - [59]
	[TIME ZONE]	Set the time zone. After setting the time, when changing the time zone setting, the displayed and registered times switch to the time with the time difference. **[−12:00] - [+13:00]** (30-minute interval, without [+12:30] and with [+12:45])
	[DATE FORMAT]	Sets the display order of year/month/day. This is also applied to the recording date displayed in the clip properties. **[Y-M-D]/[M-D-Y]/[D-M-Y]** • Factory setting: [Y-M-D]
[INITIALIZE]	[LOAD FACTORY DATA]	Returns the menu values to their factory settings. **[YES], [NO]**

[CAMERA SETTINGS]

Sets the fine quality adjustment of camera videos and camera operation.

ENHANCED is the extended menu. Set [MENU] → [CAMERA SETTINGS] → [Enhanced] → [Enhanced SW] to [ON] to display the extended menu.

Item		Description of settings
[Enhanced]	[Enhanced SW]	Enables/disables the [Enhanced] function. **[ON]:** Enables the [Enhanced] function and shows the menu related to the [Enhanced] function. **[OFF]:** Disables the [Enhanced] function and hides the menu related to the [Enhanced] function. • Factory setting: [OFF]
[FPS]	[VFR SW]	Enables/disables variable frame rate. **[ON]:** Enables the variable frame rate function. The desired frame rate can be set using [PRESET VALUE]/[VARIABLE VALUE]. Audio cannot be recorded. **[OFF]:** Disables the variable frame rate function. • Factory setting: [OFF]
	[FPS MODE]	Selects the frame rate setting method. **[PRESET]:** Selects the frame rate from preset frame rates (maximum of 12). Registration is done from the control panel. **[VARIABLE]:** Selects the frame rate from all available frame rates. • Factory setting: [PRESET]
	[PRESET VALUE]	Selects a value from a maximum of 12 values set from the control panel. • Factory setting: [24fps]
	[VARIABLE VALUE]	Selects the frame rate from all available frame rates. Selectable values vary depending on [SYSTEM MODE] settings. • Factory setting: [24fps]
[WHITE]	[AWB]	Executes automatic white balancing. **[EXECUTE], [CANCEL]** • Factory setting: [CANCEL]
	[MODE]	Selects the white balance mode. **[PRESET]:** Selects the color temperature from preset color temperatures. Registration is done from the control panel. **[TEMP SHIFT]:** Selects the color temperature from all configurable color temperatures. • Factory setting: [PRESET]
	[PRESET VALUE]	Selects a value from a maximum of 12 values set from the control panel. Preset values that can be selected in the factory setting are [3200K+0GMg], [4300K+0GMg], [5600(5500)K+0GMg], and [6300K+0GMg]. • Factory setting: [3200K+0GMg]
	[TEMP SHIFT]	Selects the color temperature from all configurable color temperatures. **[2300K]…[15000K]** • Factory setting: [3200K]
	[GMg]	Adjusts the balance between green and magenta. +: Adjusts toward green. −: Adjusts toward magenta. **[−10]…[10]** • Factory setting: [0]
	[R GAIN] ENHANCED	Adjusts the Rch gain. **[−200]…[200]** • Factory setting: [0]
	[B GAIN] ENHANCED	Adjusts the Bch gain. **[−200]…[200]** • Factory setting: [0]
	[AWB OFFSET] ENHANCED	Sets the Rch gain and Bch gain value when performing automatic white balancing. **[ON]:** Maintains and adds the values of [R GAIN] and [B GAIN] after performing automatic white balancing. **[OFF]:** Resets the value of [R GAIN] and [B GAIN] after performing automatic white balancing. • Factory setting: [OFF]

Item		Description of settings
	[SHOCKLESS WHITE] ENHANCED	Sets the transition time when switching preset values. **[OFF]:** Values are immediately switched. **[1]:** Switches in approximately one second. **[2]:** Switches in approximately two seconds. **[3]:** Switches in approximately five seconds. • Factory setting: [OFF]
[BLACK] ENHANCED	[ABB] ENHANCED	Executes automatic black balancing. When executing automatic black balancing, put the cap on the lens to keep any light from entering the image sensor. **[EXECUTE], [CANCEL]** • Factory setting: [CANCEL]
	[M.PED] ENHANCED	Sets the master pedestal level. **[−100]…[100]** • Factory setting: [0]
	[R PED] ENHANCED	Adjusts the Rch pedestal level. **[−100]…[100]** • Factory setting: [0]
	[G PED] ENHANCED	Adjusts the Gch pedestal level. **[−100]…[100]** • Factory setting: [0]
	[B PED] ENHANCED	Adjusts the Bch pedestal level. **[−100]…[100]** • Factory setting: [0]
	[ABB OFFSET] ENHANCED	Sets the Rch, Gch, and Bch pedestal levels after adjusting the automatic black balance. **[ON]:** Maintains and adds the values of [R PED], [G PED], and [B PED] after performing the automatic black balance. **[OFF]:** Resets the values of [R PED], [G PED], and [B PED] after performing the automatic black balance. • Factory setting: [OFF]
[EI]	[MODE]	Switches the EXPOSURE INDEX control unit. **[ISO], [dB]** • Factory setting: [ISO]
	[SETTING(ISO)]	Sets the value when [ISO] is selected. **[800], [1000], [1250], [1600], [2000], [2500], [3200], [4000], [5000], [6400], [8000], [10000], [12800]** • Factory setting: [800]
	[SETTING(GAIN)]	Sets the value when [dB] is selected. **[0dB], [3dB], [6dB], [9dB], [12dB], [15dB], [18dB], [21dB], [24dB]** • Factory setting: [0dB]
	[GAIN OFFSET SW] ENHANCED	Sets whether to perform fine adjustment of control when [dB] is selected. **[ON], [OFF]** • Factory setting: [OFF]
	[OFFSET LEVEL] ENHANCED	Sets the fine adjustment level. **[0.0dB] - [3.0dB]** (0.1 dB step) • Factory setting: [0dB]
[SHUTTER]	[SW]	Enables/disables the shutter function. **[ON], [OFF]** • Factory setting: [ON]
	[DISPLAY MODE]	Sets the shutter display unit. **[sec]:** Displays in time. **[deg]:** Displays at shutter open angle. • Factory setting: [deg]
	[MODE]	Switches the shutter control mode. **[PRESET]:** Selects the mode from 12 modes inside the memory. **[SYNCHRO]:** Selects the mode from the operable range. • Factory setting: [PRESET]
	[SYNCHRO deg]	Sets the value of angle control ([deg]). **[1.0] - [360.0]** • Factory setting: [180.0]
	[SYNCHRO sec]	Sets the value of time control ([sec]). The lowest value changes depending on the frame rate ([FPS]) value. **[1/60] - [1/250]** • Factory setting: [1/48]
	[PRESET VALUE deg]	Selects the angle control ([deg]) value from the maximum of 12 values set in the control panel. Preset values that can be selected in the factory setting are [11.5], [22.5], [45.0], [90.0], [120.0], [144.0], [172.8], [180.0], [270.0], and [360.0]. • Factory setting: [180.0]
	[PRESET VALUE sec]	Selects the time control ([sec]) value from the maximum of 12 values set in the control panel. Preset values that can be selected in the factory setting are [1/60], [1/100], [1/120], [1/250], [1/500], [1/1000], and [1/2000]. • Factory setting: [1/60]
[TEST SIG] ENHANCED	[TEST SIG SEL] ENHANCED	Sets the test signal output. **[OFF]:** Does not output a test signal. **[BARS]:** Outputs the color bar set in [COLOR BARS TYPE]. • Factory setting: [OFF]
	[COLOR BARS TYPE] ENHANCED	Set the color bar to be used. **[SMPTE]:** Uses the color bar in the SMPTE standard. **[FULL]:** Uses full color bars. • Factory setting: [FULL]

Item		Description of settings
[DETAIL] ENHANCED	[SW] ENHANCED	Enables/disables the detail function. **[ON], [OFF]** • Factory setting: [ON]
	[CORING] ENHANCED	Sets the coring amount for the detail signal. **[0] - [60]** • Factory setting: [1]
	[MASTER LEVEL] ENHANCED	Sets the effect level for the detail signal. **[–31]…[31]** • Factory setting: [0]
[MATRIX] ENHANCED	[SW] ENHANCED	Enables/disables the matrix function. **[ON], [OFF]** • Factory setting: [OFF]
	[(R-G)_N] ENHANCED	Adjusts the linear matrix. **[–127]…[127]** • Factory setting: [0]
	[(R-G)_P] ENHANCED	Adjusts the linear matrix. **[–127]…[127]** • Factory setting: [0]
	[(R-B)_N] ENHANCED	Adjusts the linear matrix. **[–127]…[127]** • Factory setting: [0]
	[(R-B)_P] ENHANCED	Adjusts the linear matrix. **[–127]…[127]** • Factory setting: [0]
	[(G-R)_N] ENHANCED	Adjusts the linear matrix. **[–127]…[127]** • Factory setting: [0]
	[(G-R)_P] ENHANCED	Adjusts the linear matrix. **[–127]…[127]** • Factory setting: [0]
	[(G-B)_N] ENHANCED	Adjusts the linear matrix. **[–127]…[127]** • Factory setting: [0]
	[(G-B)_P] ENHANCED	Adjusts the linear matrix. **[–127]…[127]** • Factory setting: [0]
	[(B-R)_N] ENHANCED	Adjusts the linear matrix. **[–127]…[127]** • Factory setting: [0]
	[(B-R)_P] ENHANCED	Adjusts the linear matrix. **[–127]…[127]** • Factory setting: [0]
	[(B-G)_N] ENHANCED	Adjusts the linear matrix. **[–127]…[127]** • Factory setting: [0]
	[(B-G)_P] ENHANCED	Adjusts the linear matrix. **[–127]…[127]** • Factory setting: [0]
[COLOR CORRECTION] ENHANCED	[SW] ENHANCED	Enables/disables the color correction function. **[ON], [OFF]** • Factory setting: [OFF]
	[R (SAT)] ENHANCED	Corrects red color saturation. **[–63]…[63]** • Factory setting: [0]
	[R (PHASE)] ENHANCED	Corrects the red hue. **[–63]…[63]** • Factory setting: [0]
	[R-Mg (SAT)] ENHANCED	Corrects the color saturation between red and magenta. **[–63]…[63]** • Factory setting: [0]
	[R-Mg (PHASE)] ENHANCED	Corrects the hue between red and magenta. **[–63]…[63]** • Factory setting: [0]
	[Mg (SAT)] ENHANCED	Corrects magenta color saturation. **[–63]…[63]** • Factory setting: [0]
	[Mg (PHASE)] ENHANCED	Corrects the magenta hue. **[–63]…[63]** • Factory setting: [0]
	[Mg-B (SAT)] ENHANCED	Corrects the color saturation between magenta and blue. **[–63]…[63]** • Factory setting: [0]

Item		Description of settings
	[Mg-B (PHASE)] ENHANCED	Corrects the hue between magenta and blue. **[–63]…[63]** • Factory setting: [0]
	[B (SAT)] ENHANCED	Corrects blue color saturation. **[–63]…[63]** • Factory setting: [0]
	[B (PHASE)] ENHANCED	Corrects the blue hue. **[–63]…[63]** • Factory setting: [0]
	[B-Cy (SAT)] ENHANCED	Corrects the color saturation between blue and cyan. **[–63]…[63]** • Factory setting: [0]
	[B-Cy (PHASE)] ENHANCED	Corrects the hue between blue and cyan. **[–63]…[63]** • Factory setting: [0]
	[Cy (SAT)] ENHANCED	Corrects cyan color saturation. **[–63]…[63]** • Factory setting: [0]
	[Cy (PHASE)] ENHANCED	Corrects the cyan hue. **[–63]…[63]** • Factory setting: [0]
	[Cy-G (SAT)] ENHANCED	Corrects the color saturation between cyan and green. **[–63]…[63]** • Factory setting: [0]
	[Cy-G (PHASE)] ENHANCED	Corrects the hue between cyan and green. **[–63]…[63]** • Factory setting: [0]
	[G (SAT)] ENHANCED	Corrects green color saturation. **[–63]…[63]** • Factory setting: [0]
	[G (PHASE)] ENHANCED	Corrects the green hue. **[–63]…[63]** • Factory setting: [0]
	[G-Yl (SAT)] ENHANCED	Corrects the color saturation between green and yellow. **[–63]…[63]** • Factory setting: [0]
	[G-Yl (PHASE)] ENHANCED	Corrects the hue between green and yellow. **[–63]…[63]** • Factory setting: [0]
	[Yl (SAT)] ENHANCED	Corrects yellow color saturation. **[–63]…[63]** • Factory setting: [0]
	[Yl (PHASE)] ENHANCED	Corrects the yellow hue. **[–63]…[63]** • Factory setting: [0]
	[Yl-R (SAT)] ENHANCED	Corrects the color saturation between yellow and red. **[–63]…[63]** • Factory setting: [0]
	[Yl-R (PHASE)] ENHANCED	Corrects the hue between yellow and red. **[–63]…[63]** • Factory setting: [0]
[SKIN CORRECTION] ENHANCED	[SKIN AREA SW] ENHANCED	Enables/disables the function which makes fine adjustments of near skin tone colors. **[ON], [OFF]** • Factory setting: [OFF]
	[SKIN AREA HUE] ENHANCED	Makes fine adjustments in hue. **[–63]…[63]** • Factory setting: [0]
	[SKIN AREA TONE] ENHANCED	Makes fine adjustments in tone. **[–63]…[63]** • Factory setting: [0]
[EXT.FUNC] ENHANCED	[FOCUS DISP] ENHANCED	Sets the unit that displays the focus distance. **[Meter], [Feet]** • Factory setting: [Feet]
[LENS SETTING]	[A.IRIS TYPE] ENHANCED	Determines whether to set the speed control to the lens volume and use the value set in the menu. **[LENS], [CAM]** • Factory setting: [LENS]
	[A.IRIS LEVEL EFFECT] ENHANCED	Sets the target value during auto iris operation. **[0] - [100]** • Factory setting: [30]
	[A.IRIS SPEED] ENHANCED	Sets the speed when the [A.IRIS TYPE] is set to [CAM]. **[1] - [20]** • Factory setting: [10]

Item		Description of settings
	[A.IRIS WINDOW] ENHANCED	Selects the auto iris detection window. **[NORMAL1]:** Window that is near screen center. **[NORMAL2]:** Window that is near screen bottom. **[CENTER]:** Window that is a spot in the screen center. • Factory setting: [NORMAL1]
	[A.IRIS PEAK/AVE] ENHANCED	Sets the ratio included in the peak for auto iris standard. **[0] - [100]** • Factory setting: [30]
	[LENS CONNECT TYPE]	Sets the type of lens to be connected. **[TYPE B]:** Lens controlled with 12-pin connector **[TYPE C]:** Lens controlled with cooke/i communication **[OFF]:** Other lenses • Factory setting: [OFF]

[REC SETTINGS]

The various setting items of the recording function of the camera.

Item		Description of settings
[FILE SPLIT]		Sets whether to split the recording file by units of 4 GB or just maintain one file, when the following two conditions are met: • When OP-1b format codec is selected in [MENU] → [SYSTEM SETTINGS] → [SYSTEM MODE] → [MAIN CODEC]/[SUB CODEC]. • When the recording size exceeds 4 GB **[ONE FILE]:** Records in one file. **[SPLIT]:** Splits the clip every 4 GB. • Factory setting: [SPLIT] When [MAIN CODEC] is in the OP-Atom format, [SUB CODEC] is also fixed to [SPLIT].
[TC]	[SET TC]	Sets the default value of the time code to record. Hour: **[00] - [23]** Minute: **[00] - [59]** Second: **[00] - [59]** Frame: **[00] - [23]** (for [48p], [24p], [23.98p]), **[00] - [23]** (for [50i], [50p], [25p]), **[00] - [29]** (for [59.94i], [59.94p], [29.97p]) • Factory setting: [00] (various items)
	[SET UB]	Sets user bits. Enabled only when [USER] is selected in [UB MODE]. This can be set by each digit from [00] to [FF]. • Factory setting: [00]
	[TC/UB/Dur.]	Switches the time code display to the user bits and duration counter display. **[TC], [UB], [Dur.]** • Factory setting: [TC]
	[FREE/REC RUN]	Sets the operation mode to advance the built-in time code generator. **[FREE RUN]:** Advances regardless of the operation mode. **[REC RUN]:** Advances when recording is in process. • Factory setting: [FREE RUN]
	[DF/NDF]	Sets count method for the built-in time code generator of the camera. **[DF]:** Uses the drop frame mode. **[NDF]:** Uses the non-drop frame mode. • Factory setting: [DF] Enabled only when [59.94i], [59.94p], or [29.97p] is selected in [MENU] → [SYSTEM SETTINGS] → [SYSTEM MODE] → [FREQUENCY].
	[UB MODE]	Selects the user bits mode. **[FRAME RATE]:** Selects camera imaging information (such as frame rate). **[USER]:** Selects the user bits value that has been set. **[EXT INPUT]:** Records the user bits values currently input to the <TC IN/OUT> terminal. **[TIME]:** Selects the local time. (hh, mm, ss) **[DATE]:** Selects the local date and time. (YY, MM, DD, hh) • Factory setting: [FRAME RATE]
	[TC IN/OUT SEL]	Sets the input/output of the <TC IN/OUT> terminal. **[TC IN], [TC OUT]** • Factory setting: [TC OUT]
	[TC OUT]	Selects the time code output to the <TC IN/OUT> terminal. **[TCG], [TCG/TCR]** • Factory setting: [TCG]
	[TC OUT REF]	Sets the output delay of the time code output from the <TC IN/OUT> terminal. **[RECORDING], [SDI OUT]** • Factory setting: [RECORDING]
[REC METADATA]	[LOAD]	Loads the metadata upload file saved to the SD memory card.
	[RECORD]	Sets whether to add loaded metadata at a recording. **[ON]:** Adds metadata. **[OFF]:** Does not add metadata. • Factory setting: [OFF]

Item		Description of settings
	[USER CLIP NAME]	Sets data to be recorded to [USER CLIP NAME]. (When [RECORD] is [ON]) **[TYPE1]:** Records setting values of the loaded data. **[TYPE2]:** Records the loaded data and counter value. (When [RECORD] is [OFF]) **[TYPE1]:** Records the same value as [GLOBAL CLIP ID]. **[TYPE2]:** Records the same value as [CLIP NAME]. • Factory setting: [TYPE1]
	[PROPERTY]	Checks loaded metadata. This cannot be modified.
	[COUNTER RESET]	Resets the counter value when [USER CLIP NAME] is set to [TYPE2].

[VF SDI SETTINGS]

Sets the display content of the output video from the viewfinder and <VF SDI> terminal.

Item		Description of settings
[MARKER]	[SW]	Sets whether to display markers in the output from the <VF> terminal and <VF SDI> terminal. **[ON], [OFF]** • Factory setting: [ON]
	[CENTER MARKER]	Switches the center marker. **[1]:** + (large) **[2]:** Open center (large) **[3]:** + (small) **[4]:** Open center (small) **[OFF]:** Does not display. • Factory setting: [1]
	[SAFETY MARKER]	Selects the type of frame for the safety zone marker. **[1]:** Box **[2]:** Corners **[OFF]:** Does not display. • Factory setting: [OFF]
	[SAFETY AREA]	Sets the size of the safety zone marker. **[80] - [100%]** (1% step, fixed aspect ratio) • Factory setting: [90%]
	[FRAME MARK]	Enables/disables frame marker. **[ON], [OFF]** • Factory setting: [OFF]
	[FRAME SIG]	Sets frame marker aspect ratio. **[1.33:1], [1.44:1], [1.56:1], [1.78:1], [1.85:1], [2.35:1]** • Factory setting: [2.35:1]
	[FRAME LEVEL]	Sets the level of the outside of the frame marker. **[0%] - [100%]** (10% step) • Factory setting: [100%]
	[MARKER & CHAR LVL]	Sets the marker and character luminance. **[50%], [60%], [70%]** • Factory setting: [50%]
	[USER BOX]	Sets whether to display/hide the user box display. **[ON], [OFF]** • Factory setting: [OFF]
	[USER BOX WIDTH]	Sets the width of the user box. **[1]…[100]** • Factory setting: [13]
	[USER BOX HEIGHT]	Sets the height of the user box. **[1]…[100]** • Factory setting: [13]
	[USER BOX H POS]	Sets the horizontal position of the center of the user box. **[–50]…[50]** • Factory setting: [0]
	[USER BOX V POS]	Sets the vertical position of the center of the user box. **[–50]…[50]** • Factory setting: [0]
[ZEBRA]	[ZEBRA MASTER SW]	Sets whether to superimpose the zebra signal on the output from the <VF> terminal and <VF SDI> terminal. **[ON], [OFF]** • Factory setting: [OFF]
	[ZEBRA2 SW]	Enables/disables zebra pattern 2 and selects [SPOT]. **[ON], [SPOT], [OFF]** • Factory setting: [OFF]
	[ZEBRA1 DETECT]	Sets the detection level of zebra pattern 1. **[0%] - [109%]** • Factory setting: [80%]
	[ZEBRA2 DETECT]	Sets the extraction level of zebra pattern 2. **[0%] - [109%]** • Factory setting: [100%]

Item		Description of settings
[INDICATOR]	[MASTER SW]	Sets whether to display items that will be set by [INDICATOR] in the output from the <VF> terminal and <VF SDI> terminal. **[ON]:** Items are individually displayed/hidden. **[OFF]:** Hides all. • Factory setting: [ON]
	[SYSTEM PIXEL]	Displays/hides system pixels. **[ON], [OFF]** • Factory setting: [ON]
	[SYSTEM FREQ]	Displays/hides system frequency. [ON], [OFF] • Factory setting: [ON]
	[REC FORMAT]	Displays/hides recording format display. **[ON], [OFF]** • Factory setting: [ON]
	[FPS]	Displays/hides [FPS]. **[ON], [OFF]** • Factory setting: [ON]
	[SHUTTER]	Displays/hides shutter speed. **[ON], [OFF]** • Factory setting: [ON]
	[EI]	Displays/hides EXPOSURE INDEX. **[ON], [OFF]** • Factory setting: [ON]
	[WHITE]	Displays/hides color temperature. **[ON], [OFF]** • Factory setting: [ON]
	[IRIS]	Displays/hides iris value. **[ON], [OFF]** • Factory setting: [ON]
	[FOCUS]	Displays/hides focus distance. **[ON], [OFF]** • Factory setting: [ON]
	[ZOOM]	Displays/hides zoom value. **[ON], [OFF]** • Factory setting: [ON]
	[FILTER]	Displays/hides the optical filter transmittance. **[ON], [OFF]** • Factory setting: [ON]
	[EXTENDER]	Displays/hides the extender. **[ON], [OFF]** • Factory setting: [ON]
	[Y GET]	Displays/hides brightness of Y GET. **[ON], [OFF]** • Factory setting: [ON]
	[TC]	Displays/hides the time code, user bits, and duration counter displays. **[TCG/TCR], [TCG], [OFF]** • Factory setting: [TCG/TCR]
	[P2 CARD REMAIN]	Displays/hides the display of the remaining recording free space of a P2 card. **[ON], [OFF]** • Factory setting: [ON]
	[BATTERY REMAIN]	Displays/hides the estimated remaining battery charge level. **[ON], [OFF]** • Factory setting: [ON]
	[PROXY]	Displays/hides proxy information. **[ON], [OFF]** • Factory setting: [ON]
	[GPS]	Displays/hides GPS signal reception status. **[ON], [OFF]** • Factory setting: [ON]
	[REC TALLY]	Displays/hides the method of displaying the recording status. **[RED]:** The red tally lamp lights up. **[GREEN]:** The green tally lamp lights up. **[CHAR]:** The characters [REC] are displayed in the viewfinder. • Factory setting: [RED]
[ASSIST]	[EXPAND SW]	Displays/hides the enlargement display function. **[ON], [OFF]** • Factory setting: [OFF]
	[ADVANCED ASSIST SW]	Displays/hides the advanced assist function (peaking and focus square). **[ON], [OFF]** • Factory setting: [OFF]
	[PEAKING SW]	Displays/hides the peaking function. **[ON], [OFF]** • Factory setting: [OFF]

Item		Description of settings
	[FOCUS SQUARES SW]	Displays/hides the focus square function. **[ON], [OFF]** • Factory setting: [OFF]
	[EXPAND POS]	Adjusts the source signal position in an enlarged display. **[0]…[8]** • Factory setting: [4]
	[EXPAND VALUE]	Adjusts the enlargement factor. **[x2], [x3], [x4]** • Factory setting: [x2]
	[EXPAND MODE]	Sets the enlargement display function mode. **[10SEC], [HOLD], [UNTIL REC]** • Factory setting: [10SEC]
	[PEAKING]	Sets the peaking function mode. **[LOW], [MID], [HIGH]** • Factory setting: [LOW]
	[COLOR]	Sets the peaking function color. **[RED], [GREEN], [WHITE]** • Factory setting: [RED]
	[MONO SW]	Enables/disables the monochromatic display function when [ADVANCED ASSIST SW] is set to [ON]. **[ON], [OFF]** • Factory setting: [OFF]
	[FOCUS BAR SW]	Enables/disables the focus bar display function. **[ON], [OFF]** • Factory setting: [ON]
[SURROUND VIEW]	[VIEW SW]	Enables/disables the surround view function (the function to display the image outside the effective range on the viewfinder). **[ON], [OFF]** • Factory setting: [OFF]
	[LINE SW]	Enables/disables the effective area line mark display function. **[ON], [OFF]** • Factory setting: [ON]
	[LINE COLOR]	Sets the effective area line mark color. **[BLACK], [WHITE]** • Factory setting: [WHITE]
	[MASK SIGNAL]	Sets the microphone level for the surround signal. **[OFF], [75%], [50%], [25%]** • Factory setting: [OFF]
[VF SDI DISPLAY]	[VF SDI 1080p to 1080i]	Sets whether to output 1080i signals from the <VF SDI> terminal. **[ON], [OFF]** • Factory setting: [OFF]
	[SMOOTH MODE]	Enables/disables the smooth mode (function which smoothens the viewfinder image when 24P and half shutter function is running). **[ON], [OFF]** • Factory setting: [OFF]
	[WFM]	Displays/hides waveform monitor. **[ON]/[OFF]** • Factory setting: [OFF]

[PERIPHERAL]

Applies settings related to functions used in conjunction with peripheral devices, such as network and GPS devices. Network functions will be supported in future versions.

Item	Description of settings
[GPS]	Configures internal GPS settings. **[ON]:** Activates the GPS operation. Outputs the location information as a signal to the <SDI OUT> terminal and records it as clip metadata. **[OFF]:** Does not activate the GPS operation. Does not output and record the location information. • Factory setting: [ON]

Menu operations

■ **Operation**

- UI: Settings can be performed using the control panel
- SW: Settings can be performed using switches and buttons
- VF: Settings can be performed using viewfinder menu and buttons.
- ✓: Items for operation.
- —: Non-operation items.

[SYSTEM SETTINGS]

Item		Operation		
		UI	SW	VF
[SYSTEM MODE]	[FREQUENCY]	✓	—	—
	[PIXEL]	✓	—	—
	[MAIN CODEC]	✓	—	—
	[SUB CODEC]	✓	—	—
[COLOR SETTING]	[MAIN]	✓	—	—
	[GRADING]	✓	—	—
	[SUB]	✓	—	—
	[3D LUT]	✓	—	—
	[CDL]	✓	—	—
	[MON 1]	✓	✓	—
	[MON 2]	✓	✓	—
	[EVF]	✓	✓	—
[AUDIO INPUT]	[AES/EBU IN]	—	—	—
	[FRONT MIC POWER]	—	—	—
	[FRONT MIC LEVEL]	—	—	—
	[REAR IN1 MIC POWER]	—	—	—
	[REAR IN2 MIC POWER]	—	—	—
	[REAR IN1 MIC LEVEL]	—	—	—
	[REAR IN2 MIC LEVEL]	—	—	—
	[REAR IN LINE LEVEL]	—	—	—
	[FRONT1 MIC LOWCUT]	—	—	—
	[FRONT2 MIC LOWCUT]	—	—	—
	[REAR1 MIC LOWCUT]	—	—	—
	[REAR2 MIC LOWCUT]	—	—	—
	[CH IN SEL]	✓	—	—
	[TEST TONE]	—	—	—
[AUDIO LEVEL]	[FRONT1 LEVEL]	✓	—	—
	[FRONT2 LEVEL]	✓	—	—
	[REAR1 LEVEL]	✓	—	—
	[REAR2 LEVEL]	✓	—	—
	[FRONT1 VR]	✓	—	—
	[FRONT2 VR]	✓	—	—
	[REAR1 VR]	✓	—	—
	[REAR2 VR]	✓	—	—
	[FRONT1 LIMITER]	—	—	—
	[FRONT2 LIMITER]	—	—	—
	[REAR1 LIMITER]	—	—	—
	[REAR2 LIMITER]	—	—	—
	[HEADROOM]	—	—	—
[AUDIO OUTPUT]	[MONITOR SEL1]	✓	—	—
	[MONITOR SEL2]	✓	—	—
	[MONITOR DELAY]	—	—	—
	[MONITOR VR]	✓	—	—
	[ALARM]	✓	—	—
[CONTROL DISPLAY]	[BRIGHTNESS]	—	—	—
	[COLOR LEVEL]	—	—	—
	[CONTRAST]	—	—	—
	[BACK LIGHT]	✓	—	—
	[BUTTON LED]	—	—	—

Item		Operation		
		UI	SW	VF
	[STATUS]	—	—	—
[SDI OUT]	[P to PsF]	—	—	—
	[4K OUT TYPE]	—	—	—
	[3G-SDI OUT]	—	—	—
	[SDI REC REMOTE]	—	—	—
[MON OUT]	[1080p to 1080i]	—	—	—
	[3G-SDI OUT]	—	—	—
	[MON OUT2 SIGNAL SEL]	—	—	—
	[MON OUT1 STATUS]	—	—	—
	[MON OUT2 STATUS]	—	—	—
	[MENU DISP]	—	—	—
[MON OUT INDICATOR]	[SYSTEM PIXEL]	—	—	—
	[SYSTEM FREQ]	—	—	—
	[REC FORMAT]	—	—	—
	[FPS]	—	—	—
	[SHUTTER]	—	—	—
	[EI]	—	—	—
	[WHITE]	—	—	—
	[IRIS]	—	—	—
	[FOCUS]	—	—	—
	[ZOOM]	—	—	—
	[FILTER]	—	—	—
	[EXTENDER]	—	—	—
	[Y GET]	—	—	—
	[TC]	—	—	—
	[P2 CARD REMAIN]	—	—	—
	[BATTERY REMAIN]	—	—	—
	[PROXY]	—	—	—
	[GPS]	—	—	—
[MON OUT MARKER]	[MON OUT1 SW]	—	—	—
	[MON OUT2 SW]	—	—	—
	[LCD SW]	—	—	—
	[CENTER MARKER]	—	—	—
	[SAFETY MARKER]	—	—	—
	[SAFETY AREA]	—	—	—
	[FRAME MARK]	—	—	—
	[FRAME SIG]	—	—	—
	[FRAME LEVEL]	—	—	—
	[MARKER & CHAR LVL]	—	—	—
	[USER BOX]	—	—	—
	[USER BOX WIDTH]	—	—	—
	[USER BOX HEIGHT]	—	—	—
	[USER BOX H POS]	—	—	—
	[USER BOX V POS]	—	—	—
[GENLOCK]	[GENLOCK MODE]	—	—	—
	[H PHASE COARSE]	—	—	—
	[H PHASE FINE]	—	—	—
[INFORMATION]	[OPERATION TIME]	✓	—	—
	[VERSION]	✓	—	—
	[UPDATE]	✓	—	—
	[ONLINE SUPPORT]	✓	—	—
	[TRACE LOG]	✓	—	—
	[SENSOR TEMP]	✓	—	—
	[FAN]	—	—	—
[CARDS/MEDIA]	[CPS PASSWORD]	✓	—	—
	[FORMAT CARD]	✓	—	—
	[MEDIA END ALARM]	—	—	—
[USER SWITCHS]	[USER1]	—	✓	—
	[USER2]	—	✓	—
	[USER3]	—	✓	—

Item		Operation		
		UI	SW	VF
	[USER4]	—	✓	—
	[USER5]	—	✓	—
	[USER6]	—	✓	—
	[USER7]	—	✓	—
	[USER8]	—	✓	—
	[USER9]	—	✓	—
	[USER10]	—	✓	—
[BATTERY]	[BATTERY SELECT]	—	—	—
	[EXT DC IN SELECT]	—	—	—
	[FULL Volt]	—	—	—
	[NEAR END Volt]	—	—	—
	[END Volt]	—	—	—
	[NEAR END Info]	—	—	—
	[END Info]	—	—	—
	[EXT DC FULL]	—	—	—
	[EXT DC NEAR END]	—	—	—
	[EXT DC END]	—	—	—
	[END ALARM]	—	—	—
[CLOCK]	[CLOCK SETTING]	—	—	—
	[TIME ZONE]	—	—	—
	[DATE FORMAT]	—	—	—
[INITIALIZE]	[LOAD FACTORY DATA]	—	—	—

[CAMERA SETTINGS]

Item		Operation		
		UI	SW	VF
[Enhanced]	[Enhanced SW]	—	—	—
[FPS]	[VFR SW]	✓	—	—
	[FPS MODE]	✓	—	—
	[PRESET VALUE]	✓	—	✓
	[VARIABLE VALUE]	✓	✓	✓
[WHITE]	[AWB]	✓	—	—
	[MODE]	✓	—	—
	[PRESET VALUE]	✓	✓	✓
	[TEMP SHIFT]	✓	✓	✓
	[GMg]	✓	—	—
	[R GAIN]	—	—	—
	[B GAIN]	—	—	—
	[AWB OFFSET]	—	—	—
	[SHOCKLESS WHITE]	—	—	—
[BLACK]	[ABB]	—	—	—
	[M.PED]	—	—	—
	[R PED]	—	—	—
	[G PED]	—	—	—
	[B PED]	—	—	—
	[ABB OFFSET]	—	—	—
[FLARE]	[SW]	—	—	—
	[R FLARE]	—	—	—
	[G FLARE]	—	—	—
	[B FLARE]	—	—	—
[EI]	[MODE]	✓	—	—
	[SETTING(ISO)]	✓	✓	✓
	[SETTING(GAIN)]	✓	✓	✓
	[GAIN OFFSET SW]	—	—	—
	[OFFSET LEVEL]	—	—	—
[SHUTTER]	[SW]	✓	—	—
	[DISPLAY MODE]	✓	—	—
	[MODE]	✓	—	—
	[SYNCHRO deg]	✓	✓	✓

Item		Operation		
		UI	SW	VF
	[SYNCHRO sec]	✓	✓	✓
	[PRESET VALUE deg]	✓	✓	✓
	[PRESET VALUE sec]	✓	✓	✓
[TEST SIG]	[TEST SIG SEL]	—	—	—
	[COLOR BARS TYPE]	—	—	—
[DETAIL]	[SW]	—	—	—
	[CORING]	—	—	—
	[MASTER LEVEL]	—	—	—
[MATRIX]	[SW]	—	—	—
	[(R-G)_N]	—	—	—
	[(R-G)_P]	—	—	—
	[(R-B)_N]	—	—	—
	[(R-B)_P]	—	—	—
	[(G-R)_N]	—	—	—
	[(G-R)_P]	—	—	—
	[(G-B)_N]	—	—	—
	[(G-B)_P]	—	—	—
	[(B-R)_N]	—	—	—
	[(B-R)_P]	—	—	—
	[(B-G)_N]	—	—	—
	[(B-G)_P]	—	—	—
[COLOR CORRECTION]	[SW]	—	—	—
	[R (SAT)]	—	—	—
	[R (PHASE)]	—	—	—
	[R-Mg (SAT)]	—	—	—
	[R-Mg (PHASE)]	—	—	—
	[Mg (SAT)]	—	—	—
	[Mg (PHASE)]	—	—	—
	[Mg-B (SAT)]	—	—	—
	[Mg-B (PHASE)]	—	—	—
	[B (SAT)]	—	—	—
	[B (PHASE)]	—	—	—
	[B-Cy (SAT)]	—	—	—
	[B-Cy (PHASE)]	—	—	—
	[Cy (SAT)]	—	—	—
	[Cy (PHASE)]	—	—	—
	[Cy-G (SAT)]	—	—	—
	[Cy-G (PHASE)]	—	—	—
	[G (SAT)]	—	—	—
	[G (PHASE)]	—	—	—
	[G-Yl (SAT)]	—	—	—
	[G-Yl (PHASE)]	—	—	—
	[Yl (SAT)]	—	—	—
	[Yl (PHASE)]	—	—	—
	[Yl-R (SAT)]	—	—	—
	[Yl-R (PHASE)]	—	—	—
[SKIN CORRECTION]	[SKIN AREA SW]	—	—	—
	[SKIN AREA HUE]	—	—	—
	[SKIN AREA TONE]	—	—	—
[EXT.FUNC]	[FOCUS DISP]	—	—	—
[LENS SETTING]	[A.IRIS TYPE]	—	—	—
	[A.IRIS LEVEL EFFECT]	—	—	—
	[A.IRIS SPEED]	—	—	—
	[A.IRIS WINDOW]	—	—	—
	[A.IRIS PEAK/AVE]	—	—	—
	[LENS CONNECT TYPE]	—	—	—

[REC SETTINGS]

Item		Operation		
		UI	SW	VF
[FILE SPLIT]		—	—	—
[TC]	[SET TC]	✓	—	—
	[SET UB]	✓	—	—
	[TC/UB/Dur.]	✓	—	—
	[FREE/REC RUN]	✓	—	—
	[DF/NDF]	✓	—	—
	[UB MODE]	✓	—	—
	[TC IN/OUT SEL]	—	—	—
	[TC OUT]	—	—	—
	[TC OUT REF]	—	—	—
[REC METADATA]	[LOAD]	—	—	—
	[RECORD]	—	—	—
	[USER CLIP NAME]	—	—	—
	[PROPERTY]	—	—	—
	[COUNTER RESET]	—	—	—

[VF SDI SETTINGS]

Item		Operation		
		UI	SW	VF
[MARKER]	[SW]	—	—	✓
	[CENTER MARKER]	—	—	✓
	[SAFETY MARKER]	—	—	✓
	[SAFETY AREA]	—	—	—
	[FRAME MARK]	—	—	✓
	[FRAME SIG]	—	—	—
	[FRAME LEVEL]	—	—	—
	[MARKER & CHAR LVL]	—	—	—
	[USER BOX]	—	—	✓
	[USER BOX WIDTH]	—	—	—
	[USER BOX HEIGHT]	—	—	—
	[USER BOX H POS]	—	—	—
	[USER BOX V POS]	—	—	—
[ZEBRA]	[ZEBRA MASTER SW]	—	—	✓
	[ZEBRA2 SW]	—	—	—
	[ZEBRA1 DETECT]	—	—	—
	[ZEBRA2 DETECT]	—	—	—
[INDICATOR]	[MASTER SW]	—	—	—
	[SYSTEM PIXEL]	—	—	—
	[SYSTEM FREQ]	—	—	—
	[REC FORMAT]	—	—	—
	[FPS]	—	—	—
	[SHUTTER]	—	—	—
	[EI]	—	—	—
	[WHITE]	—	—	—
	[IRIS]	—	—	—
	[FOCUS]	—	—	—
	[ZOOM]	—	—	—
	[FILTER]	—	—	—
	[EXTENDER]	—	—	—
	[Y GET]	—	—	—
	[TC]	—	—	—
	[P2 CARD REMAIN]	—	—	—
	[BATTERY REMAIN]	—	—	—
	[PROXY]	—	—	—
	[GPS]	—	—	—
	[REC TALLY]	—	—	—
[ASSIST]	[EXPAND SW]	—	✓	—

Item		Operation		
		UI	SW	VF
	[ADVANCED ASSIST SW]	—	✓	✓
	[PEAKING SW]	—	—	—
	[FOCUS SQUARES SW]	—	—	—
	[EXPAND POS]	—	—	—
	[EXPAND VALUE]	—	—	—
	[EXPAND MODE]	—	✓	—
	[PEAKING]	—	—	—
	[COLOR]	—	—	—
	[MONO SW]	—	—	—
	[FOCUS BAR SW]	—	—	—
[SURROUND VIEW]	[VIEW SW]	—	—	✓
	[LINE SW]	—	✓	—
	[LINE COLOR]	—	—	—
	[MASK SIGNAL]	—	—	—
[VF SDI DISPLAY]	[VF SDI 1080p to 1080i]	—	—	—
	[SMOOTH MODE]	—	✓	✓
	[WFM]	—	✓	✓

[PERIPHERAL]

Item	Operation		
	UI	SW	VF
[GPS]	✓	—	—

Chapter 11 Maintenance and Inspection

Inspect the various parts of the camera before shooting. Maintenance of the camera or frequently asked questions are also described in this chapter.

Inspections before shooting

Before shooting, perform the following inspections to ensure that the system operates properly.

1 Confirm that the assembled modules and the handles are fixed securely.

2 Mount the lens and adequately charged battery.

3 Insert an expressP2 memory card or P2 memory card into the main slot, and close the slot cover.

4 Set the <POWER> switch to <ON>.

5 Check the remaining battery level with the status display on the control panel.

If the remaining battery level is low, replace the battery with adequately charged one.

6 Check the media free space with the status display on the control panel.

7 Press the <REC> button and check the following.

- The main slot card access LED flashes in orange.
- The <REC> button lights up in red.
- No system warning is displayed with the status display on the control panel.

8 Press the <REC> button again.

Confirm that the main slot card access LED lights up in orange and the <REC> button does not light in red.

9 Press the <PLAY> button to switch to the PLAY screen, and play back the clip you just recorded.

Confirm that the clip plays back properly on the control panel or viewfinder.

Maintenance

Charging the built-in battery

The camera uses the built-in battery to remember the date and time.

If the camera is not turned on for more than a half year, the built-in battery runs out and when the <POWER> switch is turned <ON>, [BACK UP BATT EMPTY] may be displayed on the viewfinder screen for approx. 5 seconds.

In that case, charging of the built-in battery is complete by connecting an external DC power supply or a battery and leaving the camera turned off for approximately four hours. Set the date and time after charging is complete.

If [BACK UP BATT EMPTY] is still displayed in the viewfinder screen after charging when the <POWER> switch is turned <ON>, the built-in battery needs to be replaced. Consult your dealer.

Warning system

If an error is detected immediately after the camera is turned on or during operation, the viewfinder and warning lamp indicate the error. Deal with the error by following the indications.

Cases indicated by error codes

Error code	Display	Description	Behavior and cause
[E-30]	[TURN POWER OFF] [P2 CARD]	An error occurred in the camera built-in memory because the P2 card being accessed was ejected. • Warning lamp flashes four times per second.	• Cannot operate. • Follow the message to turn off the power once and turn on the power again. • Ensure that there is no error in the clips on the ejected card, and restore the clips as necessary.
[E-31]	[TURN POWER OFF] [SYSTEM MODE]	System mode error occurred. • Warning lamp flashes four times per second.	• Cannot operate. • Follow the message to turn off the power once, turn on the power again, and check that there is no error display.
[E-33]	[SYSTEM ERROR] [CAMERA]	Camera unit error occurred. • Warning lamp flashes four times per second.	• The operation stops. • Contact your dealer.
[E-35]	[SYSTEM ERROR] [CODEC]	Codec control error occurred. • Warning lamp flashes four times per second.	• The operation stops. • Contact your dealer.
[E-36]	[SYSTEM ERROR] [P2 SYSTEM]	P2 system error occurred. • Warning lamp flashes four times per second.	• The operation stops. • Contact your dealer.
[E-37]	[SYSTEM ERROR] [P2CS]	P2CS microcomputer error occurred. • Warning lamp flashes four times per second.	• The operation stops. • Contact your dealer.
[E-39]	[SYSTEM ERROR] [INITIALIZE]	Video initialization error occurred. • Warning lamp flashes four times per second.	• The operation stops. • Contact your dealer.
[E-64]	[SYSTEM ERROR] [FRAME SIGNAL] (or no display)	Reference signal error occurred. • Warning lamp flashes four times per second.	• The operation stops. • Contact your dealer.

Cases indicated by error messages

During recording/playback

Display	Description	Behavior and cause
[AUTH NG CARD] (slot number)	CPS authentication of microP2 memory card has failed. The microP2 memory card whose CPS authentication failed cannot be recorded or played back.	• The current operation will continue.
[BACKUP BATT EMPTY]	Displays any reduced voltage detected on the backup battery in the internal clock when the power is turned on.	• The current operation will continue. • Charge the built-in battery.
[CARD ERROR] (slot number)	Displayed when an data error caused by the P2 card occurs during recording. Displayed after recording stops until the next operation. Also displayed for three seconds during playback when a P2 card error causes playback to stop. • If the error occurs during recording, the warning lamp flashes four times per second for approx. three seconds after recording stops. • Warning lamp does not light up when an error occurs during playback.	• The operation will stop. • After it stops, the P2 card on which the error occurred is write-protected. Replace the P2 card of the slot where the error occurred.
[DIR NG CARD] (slot number)	The directory position is not correct.	• The current operation will continue. • Make a card backup immediately and format the card to use it again.
[FAN STOPPED]	Displayed when the fan motor is stopped.	• The current operation will continue. • If the fan has stopped with error, stop using the camera immediately and consult your dealer. • If the fan has stopped, temperature of the camera will rise. Therefore, do not use the camera for a long period of time.
[HIGH TEMPERATURE]	The temperature inside the camera is higher than that of the normal conditions.	• The current operation will continue. • Turn off the power of the camera, turn it on again, and check recording and playback operations. If the problem persists, consult your dealer.
[PB INTERMITTENT] (slot number)	Playback is interrupted on the SDHC/SDXC memory card. A card whose playback performance cannot be assured is inserted.	• The current operation will continue. • Use of microP2 or P2 memory card is recommended.
[PROXY ERROR]	An error occurred in the internal proxy module.	• The current operation will continue. • Turn off the camera and turn on it again to check the recording and playback. If the error continues to occur, please consult your dealer.

Display	Description	Behavior and cause
[PROXY REC WARNING]	A proxy data recording error occurred.	• The current operation will continue. • Turn off the camera and turn on it again to check the recording and playback. If the error continues to occur, please consult your dealer.
[REC IMPOSSIBLE] (slot number)	An SDHC/SDXC memory card is inserted into the microP2 memory card slot. Recording to the SDHC/SDXC memory card is disabled.	• The current operation will continue. • Record to microP2 or P2 memory cards.
[REC WARNING] [FRAME SIGNAL]	Displayed when a video or audio error occurs during recording. • Warning lamp flashes four times per second during continuous recording.	• The current operation will continue. When input signals are disrupted, recording continues while disrupted images are recorded. Check the signal to be input to the camera. • Turn off the power and on before using it again.
[REC WARNING] [OVER MAX# CLIPS]	Displayed when attempting to record in excess of the maximum total number of clips allowed for one P2 card. • Warning lamp flashes four times per second during continuous recording.	• The operation will stop. • Replace the P2 card or delete unnecessary clips.
[REC WARNING] [PULL DOWN]	(Occurs during recording) The video pull-down sequence and time code values are not synchronized. • Warning lamp flashes four times per second during continuous recording.	• The current operation will continue. • Check the signal.
[REC WARNING] [PULL DOWN ERROR]	(Occurs at times other than during recording) The video pull-down sequence and time code values are not synchronized.	• The current operation will continue. • Check the signal.
[REC WARNING] [REC DATA]	Displayed when an error occurs in recorded data during recording. • Warning lamp flashes four times per second during continuous recording.	• The operation will continue or stop. • Turn off the power and on before using it again.
[RUN DOWN CARD] (slot number)	The maximum number of overwrites has been exceeded.	• The current operation will continue. • Replacement of the P2 card is recommended.
[SD CARD] (slot number)	An SDHC/SDXC memory card is inserted into the microP2 memory card slot.	• The current operation will continue. • Use of microP2 or P2 memory card is recommended.
[TEMPORARY PAUSE] [IRREGULAR SIG]	Recording is temporary suspended due to correct recording not possible because of the disruption of input signal from the <GENLOCK IN> terminal. The clip will be divided. • Warning lamp flashes four times per second during continuous recording.	• The operation will pause. • Recording will resume when the signal returns to normal.

During thumbnail and menu operation

Display	Description	Behavior and cause
[AUTHENTICATION ERROR!]	Manual authentication failed.	Enter the correct password.
[CANNOT ACCESS!]	Data cannot be accessed due to a content defect or some other reason.	Ensure the health of the media and the clips.
[CANNOT CHANGE!]	For a clip with the ! mark, where a thumbnail cannot be generated, the thumbnail cannot be modified in the text memo position.	Correct the settings and content to enable display of the thumbnail.
[CANNOT DELETE!]	The content versions do not match. Cannot delete.	Match the device and contents version.
[CANNOT FORMAT!]	A P2 card problem or some other reason prevents formatting.	Check the P2 card.
[CANNOT RE-CONNECT!]	Clips cannot be remerged because either clips not recorded across multiple P2 cards are selected or other reasons.	Check the selected content.
[CANNOT REPAIR IN SELECTION!]	Some of the selected clips cannot be repaired.	Check the selected content.
[CANNOT REPAIR!]	Content that cannot be repaired is selected.	Check the selected content.
[CANNOT SAVE! FILE NAME IN USE]	A settings file of the same name exists on the SD memory card.	Use another name to save the file.
[CARD FULL!]	The P2 card or SD memory card is full.	Insert a card with free space available.
[COPY IMPOSSIBLE. TOO LARGE CLIP CONTAINED! (CLIP NAME: XXXXXX)]	Files exceeding 4 GB cannot be copied to P2 memory card or microP2 memory card with 32 GB or smaller capacity.	Copy to a microP2 memory card with 32 GB or larger capacity.
[INVALID VALUE!]	The data value you entered is invalid.	Enter data within the normal range.
[LACK OF CAPACITY!]	There is not enough recording capacity left on the card.	Insert a card with sufficient recording capacity.
[MISSING CLIP!]	Shot marks cannot be attached to the clips unless all clips recorded over multiple P2 cards are present.	Insert all P2 cards over which recording extended.
[NO CARD!]	No P2 or SD memory card is inserted.	Insert the relevant media.
[NO COPY TO SAME CARD!]	A clip cannot be copied to the card storing the original clip.	Copy the selected clip to a card that does not contain the original clip.
[NO FILE!]	The specified file does not exist.	Check the file.
[NO INPUT!]	No data is entered.	Enter data and then set.

Display	Description	Behavior and cause
[NO SD CARD!]	No SD memory card.	Insert an SD memory card.
[NOT SELECTED!]	Attempted to delete without selecting clips.	Select clips to delete.
[SAME CLIP IS SELECTED!]	Multiple instances of the same clip (copies) are included in the clips selected.	Multiple instances of the same clip (copies) cannot be copied simultaneously. Remove instances of the same clip from selected items.
[TOO MANY CLIPS!]	Too many clips are selected.	Reduce the number of selected clips.
[UNKNOWN CONTENTS FORMAT!]	This is a warning of the contents for the version that is not supported by the camera.	Match the device and content versions.
[UNKNOWN DATA!]	The metadata character code is invalid.	The metadata character code is UTF-8. Enter valid characters using a viewer.
	There is a problem with data in the file.	Create the file again.
[USER CLIP NAME MODIFIED!]	When adding a counter value to the clip name, characters must be deleted.	For the counter addition setting, the user clip name plus the counter value can only contain up to 100 bytes. Characters in the clip name are automatically deleted when the total number of characters exceeds this limit.
[WRITE PROTECTED!]	The P2 card or SD memory card is write-protected.	Insert write-accessible media.

During soft keyboard operation

Display	Description	Behavior and cause
[AUTHENTICATION ERROR!]	Manual authentication failed.	Enter the correct password.
[CANNOT CHANGE!]	An attempt is made to enter the [PERSON] item (user who enters the memo) when there is no text memo.	Enter the [TEXT] (text information) first.
[CANNOT SET!] [INVALID VALUE!]	The entered value is invalid.	Change the input value.
[CANNOT SET!] [NO INPUT!]	There is not input to the software keyboard.	Enter the password.
[CANNOT SET!] [RETRY PASSWORD IS DIFFERENT!]	The re-entered password is different.	Enter the correct reference password.

Updating the camera firmware

The firmware versions of the camera module and the recording module must match to operate this system.
If they do not match, update the firmware before using the camera. Firmware of the camera module can be updated only when the recording module is connected.

Updating the firmware

To update the firmware, an SD memory card is required.
Use the camera or P2 Viewer Plus to format the SD memory card.

Fig. 1

1 Download the firmware from the website.
http://pro-av.panasonic.net/

2 Save the downloaded firmware to an SD memory card.

3 Insert the SD memory card containing the firmware into the SD memory card slot of the recording module.

4 Turn the power on.

5 Press the <INFO> button to display the INFO screen. (Fig. 1)

6 Select [VERSION].

7 Press the jog dial button.

8 When [UPDATE] appears, select [UPDATE] → [OK].
This starts the firmware update. Do not turn the power off until the update is completed.

Cleaning and storing

Cleaning the camera recorder

- Either remove the battery or disconnect the DC cable from the power outlet before cleaning.
- Do not use benzine or thinner to clean the camera. Using benzine or thinner may cause deformation or peeling off of the paint of the camera recorder body.
- Wipe the camera recorder with a soft and clean cloth. If there is heavy dirt attached, wipe the camera recorder using a cloth soaked in kitchen detergent diluted with water, and then wipe it with a dry cloth.

Cautions when storing the camera recorder

Remove the battery when storing the camera recorder. Store the battery in a place where humidity is low and temperature is relatively constant.

■ Camera body

- Wrap the camera recorder with a soft cloth so that dust does not get into it.

■ Battery

- The battery life shortens where the temperature is extremely high or low.
- Storing in a place where there is heavy oil smoke or dust may lead to malfunctions due to rust on terminal connectors, etc.
- Do not let the battery terminal contact a metal object (such as a necklace or hairpin). Short circuit may occur between terminals and it may lead to heat generation. Touching on a heated part may cause severe burns.
- Store the battery with electrically discharged. If you store it for a long period of time, it is recommended that you charge it once a year, use the camera recorder until the battery runs out, and then storing it again.

■ expressP2 memory card, P2 memory card

- If you remove it from the camera recorder, be sure to attach the dedicated cap so that sand and dust do not adhere to the connector part. Also, put it in the dedicated case when storing or carrying it.
- Do not place it in a place where there is corrosive gas.

■ microP2 memory card, SD memory card

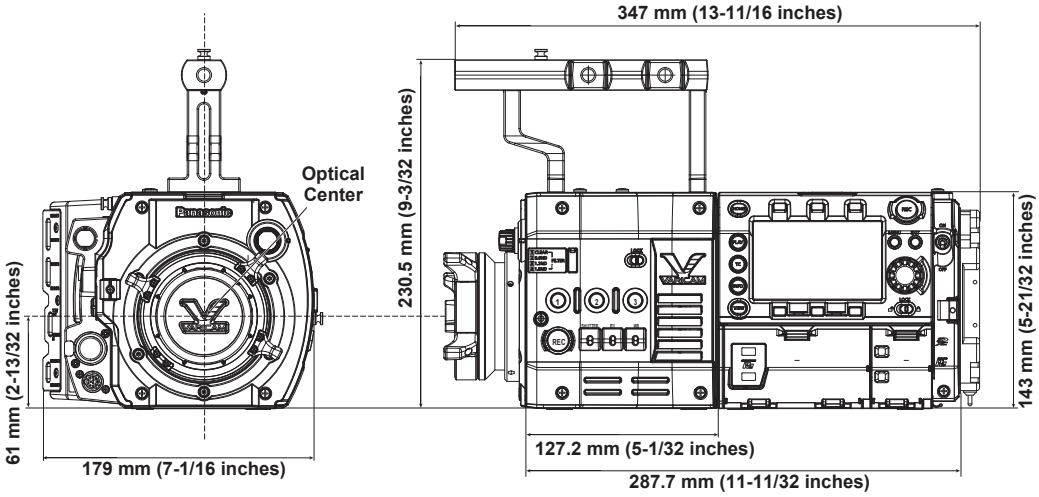
- If you remove it from the camera recorder, be sure to put it in its case.
- Do not place it in a place where there is corrosive gas.
- Do not place it in a place where temperature gets high, such as in a car or under direct sunlight.
- Do not place it in a dusty place or where humidity is high.

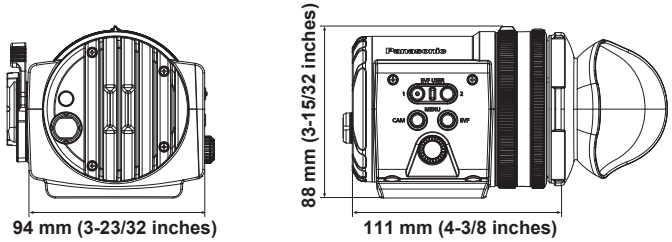
Chapter 12 Specification

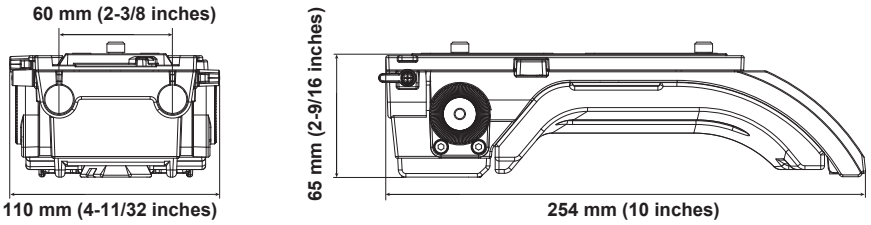
This chapter describes the specifications of this product.

Specifications

Dimensions







Specifications

General

Power DC 12 V (11.0 V - 17.0 V) Power consumption 99 W (with all optional accessories connected and maximum power supplied from each output terminal)

indicates safety information.

Ambient operating temperature	0°C - 40°C (32°F - 104°F)
Ambient operating humidity	10% - 85% (relative humidity)
Storage temperature	–20°C - 60°C (–4°F - 140°F)
Weight	Approx. 5.0 kg (11.02 lbs.) (excluding accessories)
Dimensions (W×H×D)	Body only 179.0 mm×230.5 mm×347.0 mm (7-1/16 inches×9-3/32 inches×13-11/32 inches) (excluding protrusions and accessories)

- Ensure that the total current from the <DC OUT> terminal, <VF> terminal, and <LENS> terminal of the camera module, and the <DC OUT/RS> terminal and <USB HOST> terminal of the recording module does not exceed 30 W.

Camera unit

Pickup device	Super 35 mm, MOS, 8.9 megapixels
Number of pixels	• Total number of pixels Approx. 10.3 million pixels • Number of effective pixels Approx. 8.9 million pixels
Lens mount	35 mm, PL mount
Optical filter	• ND filter <1>: <CLEAR>, <2>: <0.6ND>, <3>: <1.2ND>, <4>: <1.8ND>
Gain setting	• [ISO] mode ISO800 to ISO12800 • [dB] mode 0 dB - 24 dB (3 dBstep)
Shutter speed	• [deg] mode 1.0 deg - 358 deg (0.5 deg step) • [sec] mode 1/24 seconds - 1/250 seconds (for 24p)

Memory card recorder

Recording media	expressP2 memory card, P2 memory card, microP2 memory card
Number of recording pixels	4096×2160, 3840×2160, 1920×1080
Recording frame rate (max)	• 4K 50p/60p • HD 50p/60p
System frequency	59.94p, 50p, 29.97p, 25p
Recording format (main recorder)	AVC-Intra 4K 422/AVC-Intra 100
Recording format (sub recorder)	AVC-Intra 100/AVC-LongG 50/AVC-LongG 25
Recording video signal	4096×2160/59.94p, 50p, 29.97p, 25p, 23.98p 3840×2160/59.94p, 50p, 29.97p, 25p, 23.98p 1920×1080/59.94p, 50p, 29.97p, 25p, 23.98p
Recording and playback time ([MAIN CODEC])	When using a 256 GB expressP2 memory card • AVC-Intra 4K 422, [VFR]: [ON], 50p/59.94p Approx. 36 min • AVC-Intra 4K 422, [VFR]: [OFF], 24p Approx. 90 min • AVC-Intra 100, [VFR]: [ON], 50 fps/60 fps Approx. 128 min
	Figures are for continuous recording as one clip. Depending on the number of clips, the overall recording time may be shorter than the above.
Recording and playback time ([SUB CODEC])	When using a 64 GB microP2 memory card • AVC-Intra 100, 25.00p/29.97p Approx. 64 min • AVC-LongG 50, 25.00p/29.97p Approx. 128 min • AVC-LongG 25, 25.00p/29.97p Approx. 256 min
	Figures are for continuous recording as one clip. Depending on the number of clips, the overall recording time may be shorter than the above.

Digital video

Number of quantizing bits	10 bits
Video compression format	• AVC-Intra 4K 422/AVC-Intra 100 MPEG-4 AVC/H.264 Intra Profile • AVC-LongG 50/AVC-LongG 25 MPEG-4 AVC/H.264

Digital audio

Recording audio signal	48 kHz/24 bits, 4CH
Headroom	18 dB/20 dB switchable menu

Proxy

File format	MOV
Video compression format	H.264/AVC High Profile
Audio compression format	LPCM
Approximate recording time (1 GB)	Approx. 25 min
	Reference value for continuous recording. The recording time may differ depending on the scene or the number of clips.

Video input/output

<SDI OUT1>/<SDI OUT2>/<SDI OUT3>/<SDI OUT4> terminal	HD (1.5G)/3G-SDI: 0.8 V [p-p], 75 Ω (1 set, 4 pieces)
<MON OUT1> terminal	HD (1.5G)/3G-SDI: 0.8 V [p-p], 75 Ω
<MON OUT2> terminal	HD (1.5G)/3G-SDI: 0.8 V [p-p], 75 Ω
<VF SDI> terminal	HD (1.5G)/3G-SDI: 0.8 V [p-p], 75 Ω

Audio input/output

<AUDIO IN 1>/<AUDIO IN 2> terminal	XLR×2, 3-pin <LINE>/<MIC>/<MIC+48V>/<AES> switchable type
<MIC IN> terminal	XLR×1, 5-pin
<PHONES> terminal	Stereo mini jack
Speaker	20 mm diameter, round ×1

Viewfinder

Display panel	OLED (organic EL) 0.7 type, 2760000 dots
Video input method	1080/59.94p, 1080/50p, 1080/60p

Other input/output

<GENLOCK IN> terminal	HD (1.5G)/3G-SDI: 0.8 V [p-p], 75 Ω
<TC IN/OUT> terminal	BNC×1 Input/output switching • Input: 0.5 V - 8 V [p-p], 10 kΩ • Output: 2.0 V±0.5 V [p-p], low impedance
<DC IN> terminal	XLR×1, 4-pin, DC 12 V (DC 11.0 V - 17.0 V)
<DC OUT/RS> terminal	4-pin, DC 12 V (DC 11.0 V - 17.0 V), maximum output current 1.0 A
<DC OUT> terminal	2-pin, DC 12 V (DC 11.0 V - 17.0 V), maximum output current 1.0 A
<LENS> terminal	12-pin, 4-pin×2
<VF> terminal	14-pin
<LAN> terminal	100BASE-TX/10BASE-T
<USB2.0> terminal (device)	Type B connector, 4-pin
<USB2.0> terminal (host)	Type A connector, 4-pin
<EXT> terminal	50-pin, exclusive for external recording (to be supported)
Control panel (LCD)	3.5-type QHD color monitor (approx. 1.56 million dots)

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Z

Information for Users on Collection and Disposal of Old Equipment and used Batteries

These symbols on the products, packaging, and/or accompanying documents mean that used electrical and electronic products and batteries should 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 and the Directives 2002/96/EC and 2006/66/EC.

By disposing of these products and batteries correctly, you will help to save valuable resources and prevent any potential negative effects on human health and the environment which could otherwise arise from inappropriate waste handling.

EU

For more information about collection and recycling of old products and batteries, please contact your local municipality, your waste disposal service or the point of sale where you purchased the items.

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

EU

For business users in the European Union
If you wish to discard electrical and electronic equipment, please contact your dealer or supplier for further information.

Information on Disposal in other Countries outside the European Union
These symbols are only valid in the European Union. If you wish to discard these items, please contact your local authorities or dealer and ask for the correct method of disposal.

Cd

Note for the battery symbol (bottom two symbol examples):
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.

Panasonic Corporation
Web Site: http://panasonic.net