SONY

DIGITAL MOTION PICTURE CAMERA

F65

OPERATION MANUAL English

1st Edition (Revised 1)

Before operating the unit, please read this manual thoroughly and retain it for future reference.

WARNING

To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.

Caution
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure. Do not open the outer case and disassemble or otherwise modify.

This Digital Motion Picture Camera is classified as a CLASS 1 LASER PRODUCT.

Tämä Digital Motion Picture Camera on luokiteltu 1. LUOKAN LASERTUOTTEEKSI.

Den här Digital Motion Picture Camera klassificeras som en LASERPRODUKT AV KLASS 1.

VAROITUS!
LAITTEEN KÄYTTÄMINEN MUULLA KUIN TÄSSÄ KÄYTTÖOHJEESSA MAINITULLA TAVALLA SAATTAA ALTISTAA KÄYTTÄJÄN TURVALLISUUSLUOKAN 1 YLITTÄVÄLLE NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE.

VARNING
OM APPARATEN ANVÄNDS PÅ ANNAT SÄTT ÄN I DENNA BRUKSANVISNING SPECIFICERATS, KAN ANVÄNDAREN UTSÄTTAS FÖR OSYNLIG LASERSTRÅLNING, SOM ÖVERSKRIDER GRÄNSEN FÖR LASERKLASS 1.

Internal Laser Module Properties

Wavelength	: 850 nm
Emission duration	: Pulse Modulation
Laser output power	: 4 mW/channel (max)
Standard	: IEC60825-1 (2007)

Egenskaber for internt lasermodul

Bølgelængde	: 850 nm
Strålingsvarighed	: Pulsmodulering
Afgivet lasereffekt	: 4 mW/kanal (maks.)
Standard	: IEC60825-1 (2007)

Egenskaper för intern lasermodul

Våglängd	: 850 nm
Strålningens varaktighet	: Pulsmodulation
Lasereffekt	: 4 mW/kanal (max)
Standard	: IEC60825-1 (2007)

Egenskaper for innvendig lasermodul

Bølgelengde	: 850 nm
Strålingsvarighet	: Pulsmodulasjon
Utgangseffekt for laser	: 4 mW / kanal (maks.)
Standard	: IEC60825-1 (2007)

Caution
The use of optical instruments with this product will increase eye hazard.

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

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

All interface cables used to connect peripherals must be shielded in order to comply with the limits for a digital device pursuant to Subpart B of Part 15 of FCC Rules.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For the customers in Canada
This Class A digital apparatus complies with Canadian ICES-003.

For the customers in Europe
This product with the CE marking complies with the EMC Directive issued by the Commission of the European Community.
Compliance with this directive implies conformity to the following European standards:
• EN55103-1: Electromagnetic Interference(Emission)
• EN55103-2: Electromagnetic Susceptibility(Immunity)
This product is intended for use in the following Electromagnetic Environments: E1 (residential), E2 (commercial and light industrial), E3 (urban outdoors), E4 (controlled EMC environment, ex. TV studio).

The manufacturer of this product is Sony Corporation, 1-7-1 Konan, Minato-ku, Tokyo, 108-0075 Japan.

The Authorized Representative for EMC and product safety is Sony Deutschland GmbH, Hedelfinger Strasse 61, 70327 Stuttgart, Germany. For any service or guarantee matters please refer to the addresses given in separate service or guarantee documents.

For the State of California, USA only
Perchlorate Material - special handling may apply, See www.dtsc.ca.gov/hazardouswaste/perchlorate
Perchlorate Material : Lithium battery contains perchlorate.

For the customers in Taiwan only

廢電池請回收

AVERTISSEMENT

Afin de réduire les risques d'incendie ou d'électrocution, ne pas exposer cet appareil à la pluie ou à l'humidité.

Afin d'écarter tout risque d'électrocution, garder le coffret fermé. Ne confier l'entretien de l'appareil qu'à un personnel qualifié.

Digital Motion Picture Camera est classée comme PRODUIT LASER DE CLASSE 1.

Propriétés du module laser interne

Longueur d'onde	: 850 nm
Durée d'émission	: Modulation d'impulsion
Puissance du laser	: 4 mW/canal (max)
Norme	: IEC60825-1 (2007)

Pour les clients au Canada
Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Pour les clients en Europe
Ce produit portant la marque CE est conforme à la Directive sur la compatibilité électromagnétique (EMC) émise par la Commission de la Communauté européenne.
La conformité à cette directive implique la conformité aux normes européennes suivantes :
• EN55103-1 : Interférences électromagnétiques (émission)
• EN55103-2 : Sensibilité électromagnétique (immunité)
Ce produit est prévu pour être utilisé dans les environnements électromagnétiques suivants : E1 (résidentiel), E2 (commercial et industrie légère), E3 (urbain extérieur) et E4 (environnement EMC contrôlé, ex. studio de télévision).

Le fabricant de ce produit est Sony Corporation, 1-7-1 Konan, Minato-ku, Tokyo, 108-0075 Japon.
Le représentant autorisé pour EMC et la sécurité des produits est Sony Deutschland GmbH, Hedelfinger Strasse 61, 70327 Stuttgart, Allemagne. Pour toute question concernant le service ou la garantie, veuillez consulter les adresses indiquées dans les documents de service ou de garantie séparés.

WARNUNG

Um die Gefahr von Bränden oder elektrischen Schlägen zu verringern, darf dieses Gerät nicht Regen oder Feuchtigkeit ausgesetzt werden.

Um einen elektrischen Schlag zu vermeiden, darf das Gehäuse nicht geöffnet werden. Überlassen Sie Wartungsarbeiten stets nur qualifiziertem Fachpersonal.

Dieser Digital Motion Picture Camera ist als LASERPRODUKT DER KLASSE 1 eingestuft.

Eigenschaften des internen Lasermoduls

Wellenlänge	: 850 nm
Emissionsdauer	: Pulsmodulation
Laser-Ausgangsleistung	: 4 mW/Kanal (max.)
Standard	: IEC60825-1 (2007)

Für Kunden in Europa

Dieses Produkt besitzt die CE-Kennzeichnung und erfüllt die EMV-Richtlinie der EG-Kommission.
Angewandte Normen:

- EN55103-1: Elektromagnetische Verträglichkeit (Störaussendung)
- EN55103-2: Elektromagnetische Verträglichkeit (Störfestigkeit)

Für die folgenden elektromagnetischen Umgebungen: E1 (Wohnbereich), E2 (kommerzieller und in beschränktem Maße industrieller Bereich), E3 (Stadtbereich im Freien) und E4 (kontrollierter EMV-Bereich, z.B. Fernsehstudio).

Der Hersteller dieses Produkts ist Sony Corporation, 1-7-1 Konan, Minato-ku, Tokyo, 108-0075 Japan.
Der autorisierte Repräsentant für EMV und Produktsicherheit ist Sony Deutschland GmbH, Hedelfinger Strasse 61, 70327 Stuttgart, Deutschland. Bei jeglichen Angelegenheiten in Bezug auf Kundendienst oder Garantie wenden Sie sich bitte an die in den separaten Kundendienst- oder Garantiedokumenten aufgeführten Anschriften.

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Chapter 1 Overview

1-1 Features

The F65 is a digital motion picture camera equipped with a Super 35-mm type CMOS sensor array with a total of 20 Megapixels.
The camera is incorporated with newly developed imagers and a digital signal-processing LSI that yield images of a high quality for cinematic, commercial, and dramatic production applications. The camera also supports the features of a "production camera" up to details in its shape, button and indicator layout, and materials of the parts.

Superior picture quality and high performance

Super 35-mm type CMOS and PL mount

With the F65's Super 35-mm-type CMOS imagers and PL mount, most movie lenses designed for conventional 35-mm film cameras can be mounted without a converter.

Wide latitude and high-quality pictures

With its newly developed imagers, and unique 16-bit digital LSI, the camera achieves wide latitude and high-grade picture quality with minimal noise.

RAW image output

Outputs RAW image data, without camera signal processing or non-linear gamma processing, for increased convenience during post-production.

Multiple frame formats

The camera supports 3840/4096-pixel wide images for high-end content creation, including commercial and broadcasting program production as well as movie making.
The camera supports the following formats.
F65RAW mode: 23.98p, 24p, 25p, 29.97p, 59.94p, S59.94p (Select FPS), S60p (Select FPS)
HD mode: 23.98p, 25p, 29.97p

Imaging characteristics with wide color space

Sony's unique technology color filters allow the camera to capture images with natural-looking color reproduction close to those of the actual scene.

S-LOG gamma and 709(800%) gamma for monitors

The camera is equipped with S-LOG gamma for checking the entire dynamic range of the image, and 709(800%) gamma for general monitoring.

Mechanical rotary shutter

The camera is equipped with a mechanical rotary shutter that eliminates the rolling shutter effect common to conventional CMOS image sensors.

HD shooting

When used with the SR-R4 recorder, the camera can also shoot images in HD mode, in addition to RAW mode. SR-R4 version 1.4 or later is required to record in HD.

Design and shape

New compact design

For a high level of mobility in consideration of various shooting situations, such as inside a car, the camera is housed in as compact a body as possible. In addition, buttons and indicators are laid out to provide a familiar and intuitive user interface to users of conventional cinema film cameras.

Dockable system for the SR-R4 Portable Memory Recorder

A dockable interface system for docking with the SR-R4 is employed for versatility under shooting conditions and on-site demands.

Compatible with film-camera accessories

The F65 is designed to be compatible with a variety of film-camera accessories, giving users a broad array of choices. These include ARRIFLEX-made bridge plates, matte boxes, follow focus units, lens focus/zoom/iris servo control units, and more. These film-camera accessories can be attached to the F65 without modification, enabling

users who principally work with film to fully utilize their existing assets.
The F65 is equipped with one 12 V DC and connector one 24 V DC[1)] output connector to supply power to accessories connected to the camera.

1) To supply accessories with 24 V DC power, the camera must have both 12 V DC and 24 V DC supplies, and the CAM POWER switch must be turned ON.

Assignable buttons

The F65 is equipped with assignable buttons on the side of the camera head.
The operator can assign frequently used functions, such as magnifying the image in the viewfinder, to assignable buttons to call these functions rapidly when working in the field.

Operational versatility

Shooting mode presumes post-production processing

The F65 does not perform processing of images on-site, instead you shoot in a mode that presumes images will be processed in post-production, in much the same way you would operate a film camera.

Shutter control

The shutter speed is adjustable in terms of shutter angle. You can also switch between a mechanical rotary shutter and an electronic shutter.

Monitor output selection

You can select imposition of markers in the monitor output, and also select a look-up table (LUT) for the desired tone of the monitor image.

Sensitivity adjustment function

The F65 employs an EI sensitivity indicator for shooting using a light meter, just as for film cameras, to enable overexposure/underexposure processing in post-production.

Other features

USB host connectors

The camera is equipped with USB connectors (host) for connection with an optional Wi-Fi adapter (CBK-WA01) to enable wireless camera operation from a tablet or other Wi-Fi capable device.

Supports various setup methods

The F65 can be configured from a variety of devices. The basic configuration is performed on the camera's subdisplay. However, detailed settings can be performed from the menu (VF Menu) displayed in the viewfinder or on a monitor connected to the SDI OUT connector. You can also make detailed settings by displaying the menu in a web browser or on a tablet device, such as an iPad.[1,2)]

1) iPad is a trademark of Apple Inc.
2) The items displayed in the menu that can be configured using a web browser or a tablet device may vary. For details, see *"4-2 VF Menu List" (page 40)*.

1-2 Example of System Configuration

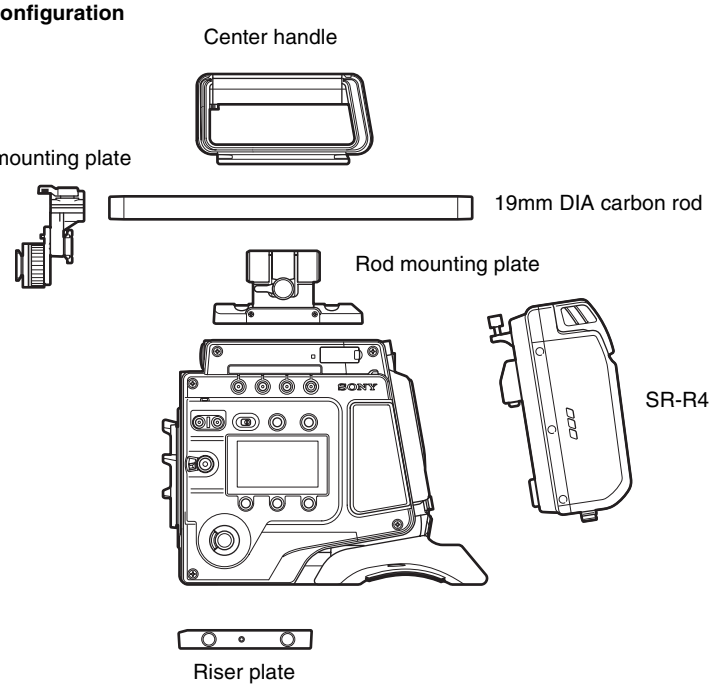
The diagram below shows a system configuration example for use of this camera.
This manual assumes the use of an optional Sony HD Electronic Viewfinder.

For more information about the fittings, connections, or use of additional equipment and accessories, see "Chapter 2 Installation and Preparations" (page 16) as well as the operation manuals for the connected equipment.

Viewfinder

Product	Model name
HD Electronic Viewfinder	HDVF-C30WR, HDVF-C35W, HDVF-20A, HDVF-200

F65 Product Configuration



Products for tripod mounting

Product	Model name
Bridge Plate	BP-8 (ARRIFLEX)
Shoulder Set	S-4 (ARRIFLEX)

Video recorder

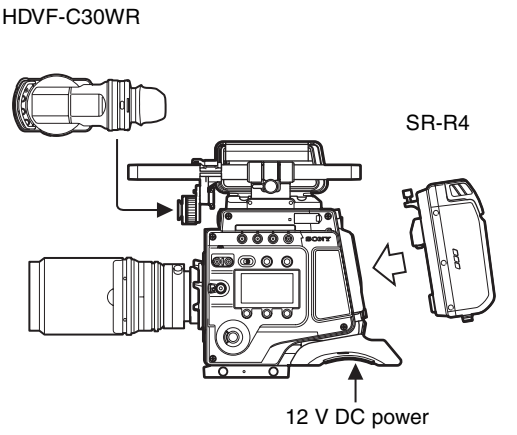
Product	Model name
Portable Memory Recorder	SR-R4

Note

If attaching and using products, such as a shoulder set, from other manufacturers, check beforehand that the product can be fitted correctly to the camera.

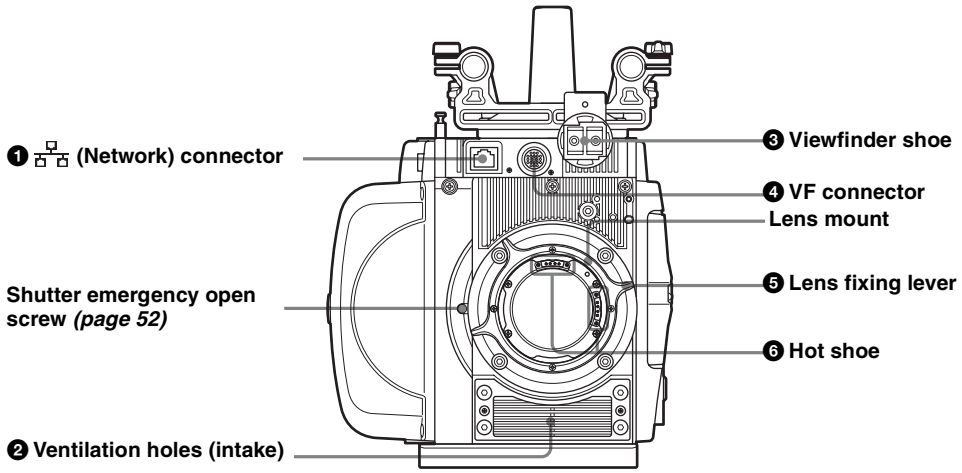
1-2-1 SR-R4 Docking System

An SR-R4 recorder can be docked on the rear of the camera head.
The SR-R4 power source is supplied via the camera's DC IN connector.



1-3 Locations and Functions of Parts

Front panel



❶ (Network) connector (RJ-45 type, 10BASE-T/100BASE-TX)
Connects to a network cable when configuring the camera from a web browser on a computer.
For a network cable connection, the IP address must be configured in the Network menu in the VF menu.

For details, see "4-2-6 Network Menu" (page 46).

CAUTION

- For safety, do not connect the connector for peripheral device wiring that might have excessive voltage to this port. Follow the instructions for this port.
- When you connect the network cable of the unit to peripheral device, use a shielded-type cable to prevent malfunction due to radiation noise.

ATTENTION

- Par mesure de sécurité, ne raccordez pas le connecteur pour le câblage de périphériques pouvant avoir une tension excessive à ce port. Suivez les instructions pour ce port.
- Lors de la connexion du câble réseau de l'appareil au périphérique, utilisez un câble blindé afin d'empêcher tout dysfonctionnement dû au bruit de rayonnement.

VORSICHT

- Aus Sicherheitsgründen nicht mit einem Peripheriegerät-Anschluss verbinden, der zu starke Spannung für diese Buchse haben könnte. Folgen Sie den Anweisungen für diese Buchse.
- Verwenden Sie beim Anschließen des Netzwerkkabels des Geräts an ein Peripheriegerät ein abgeschirmtes Kabel, um Fehlfunktionen aufgrund von Störungen zu vermeiden.

❷ Ventilation holes (intake)

Note

Make sure that a gap of about 8 mm ($^{11}/_{32}$ inch) is maintained in front of the ventilation holes for cooling.

❸ Viewfinder shoe
Attach an optional viewfinder.

For details, see "2-3 Attaching a Viewfinder" (page 19).

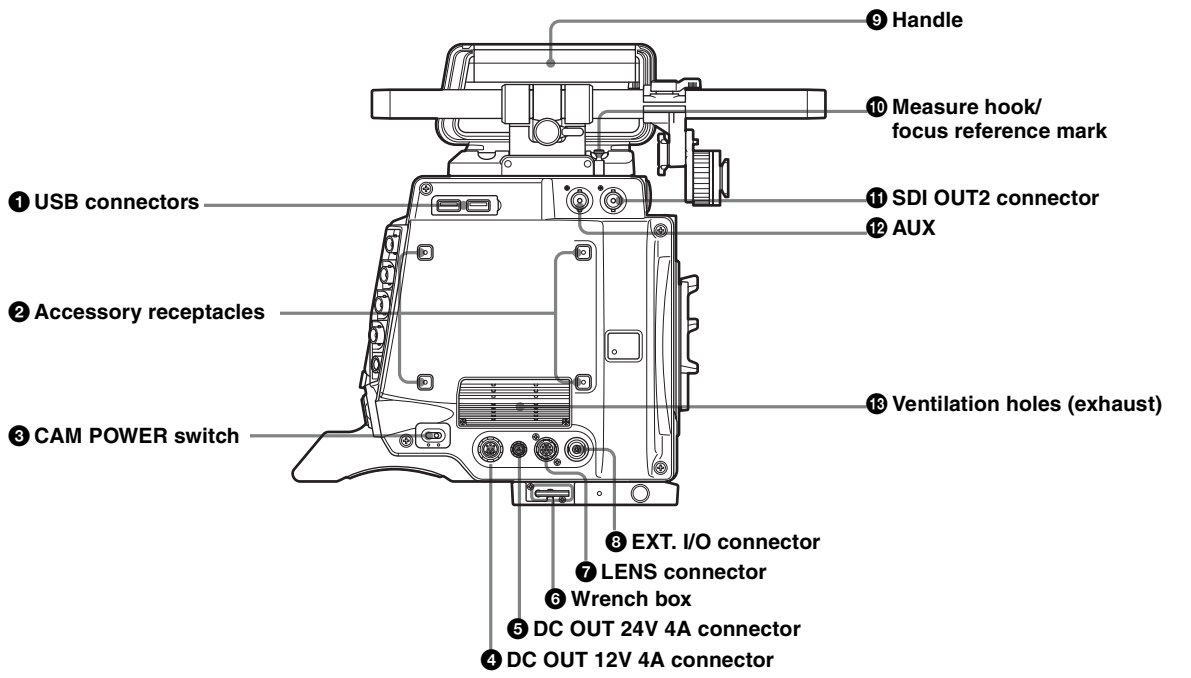
❹ VF (viewfinder) connector (20-pin)
Connects to the cable supplied with a viewfinder (optional).

❺ Lens fixing lever
When mounting a lens, turn the lever clockwise to secure the lens. To remove the lens, turn the lever counterclockwise.
If the lens fixing lever is difficult to operate due to the shape of the lens or accessory being mounted, you can remove the lever and attach it in a different orientation.

For details, see "2-2 Attaching a Lens" (page 17).

❻ Hot shoe
It is not used in this version.

Left panel



❶ USB connectors
USB 2.0 standard connector. Connect a CBK-WA01 Wi-Fi Adapter (optional) to enable communication with wireless LAN devices.

❷ Accessory receptacles
For mounting accessories using M3 screws. The depth of the screws is 5 mm ($^{7}/_{32}$ inch).

❸ CAM POWER switch
Turns the camera power supply ON/OFF.

❹ DC OUT 12V 4A (12 V DC supply output) connector
Supplies 12 V DC power source to accessories, when the CAM POWER switch is in the ON position.

❺ DC OUT 24V 4A (24 V DC supply output) connector
Supplies 24 V DC power source to accessories when there is a 24 V DC supply connected to the DC IN connector and the CAM POWER switch is in the ON position.

❻ Wrench box
Stores a 3 mm ($^{1}/_{8}$ inch) wrench for attaching/detaching the handle.

❼ LENS connector (12-pin)
It is not used in this version.

❽ EXT. I/O (external control) connector (5-pin)
It is not used in this version.

❾ Handle
The handle is attached to the top of the camera head at the factory. It has two sizes of screw holes ($^{3}/_{8}$", $^{1}/_{4}$") for accessories on the upper side.

❿ Measure hook/focus reference mark
Use as reference for focusing.
For actual measurement of the distance from a subject, you can fix the end of a tape measure to the hook.
When shooting shallow depth-of-field images in high resolution, it is recommended that you adjust the focus using the camera or viewfinder magnification function.

⓫ SDI OUT2 connector (BNC type)
Outputs the same signal as the SDI OUT1 connector on the rear panel.

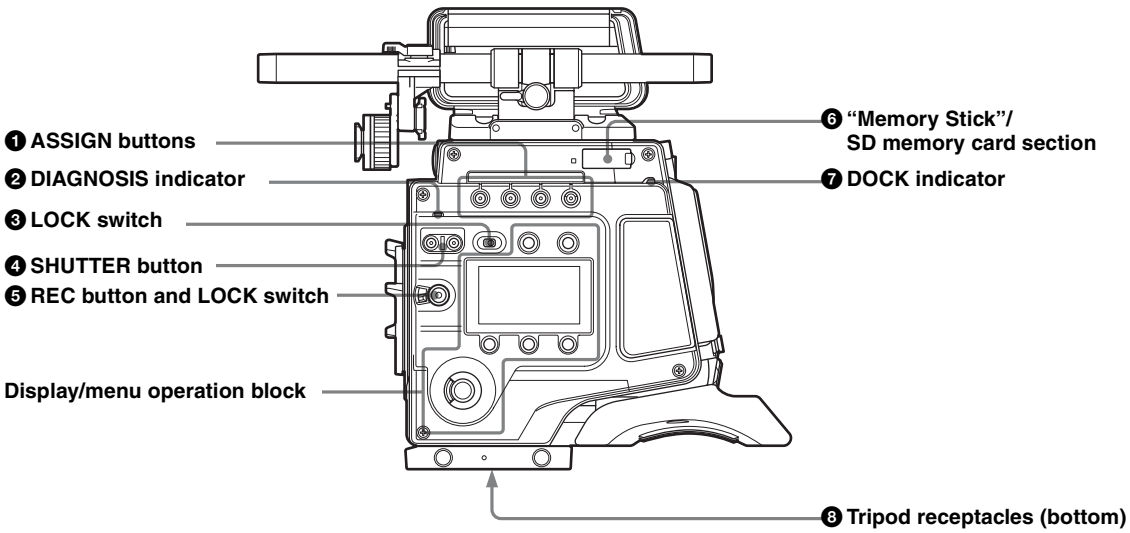
⓬ AUX (display only)
This connector is for function expansion. It is not used in this version.

⓭ Ventilation holes (exhaust)

Note

Connectors and other parts positioned near the exhaust vents may become hot.

Right panel



❶ ASSIGN (assignable) buttons

You can assign various functions to these buttons, using the subdisplay or the menu displayed in the viewfinder or on a monitor.
ASSIGN button 1 is on the far left, and ASSIGN button 4 is on the far right.

For details, see "3-3-13 Assigning Functions to the ASSIGN Buttons" (page 31).

❷ DIAGNOSIS indicator

Indicates the diagnostics status.
Lit green: Normal
Lit red: Error
Flashing red: Fatal error
Lit yellow: Not ready

If the red or flashing red indication continues, consult your local Sony representative.

❸ LOCK switch

Locks operation of the side panel (excluding the REC and PAGE buttons).

❹ SHUTTER button

Switches between the electronic shutter and the mechanical rotary shutter.
Press the "M." button to switch to the mechanical rotary shutter, or press the "E." button to switch to the electronic shutter. The button indicator for the selected shutter is lit. The shutter indicator flashes when changing shutter.

Note

It takes about 20 to 40 seconds to change shutter.

❺ REC button and LOCK switch

The REC button starts/stops recording to the SR-R4 docked on the camera. The REC button indicator is lit while recording. The indicator flashes as a warning if the connected supply voltage drops.
When the LOCK switch is in the LOCK position, the REC button cannot be operated.
The REC button cannot be operated during REC REVIEW, PLAY, F.FWD, or REW mode on the SR-R4 to prevent overwriting.

For details on warning indications, see "Warning/Error Messages" (page 50).

❻ "Memory Stick"/SD memory card section

Slots for a "Memory Stick PRO Duo" and an SD memory card are provided behind the rubber cap. The access lamp turns red when a "Memory Stick PRO Duo" or an SD memory card is inserted into a slot, and then turns off. It flashes red when reading to or writing from a "Memory Stick PRO Duo" or an SD memory card.
When the access lamp is flashing red, do not insert/remove the "Memory Stick PRO Duo" or SD memory card, or turn off the power.

❼ DOCK (docking) indicator

When an SR-R4 is docked, the light reception status of the recorder connectors is displayed.
Green: Good

Yellow: Caution level
Sensitivity has decreased, but signal can be transferred without error. Clean the recorder connector or replace the connector optical module as soon as practicable.
Red: Light detection error
A light reception problem occurred, and signal cannot be transferred correctly. Promptly clean the recorder connector or replace the connector optical module.
Off: No signal

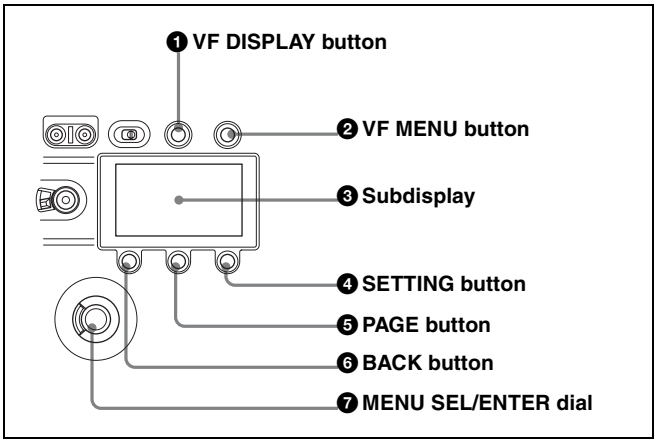
For details about cleaning the connectors, see "Cleaning the Recorder Connector" (page 53). For information about replacing the optical module, consult your local Sony representative.

❽ Tripod receptacles (bottom)
Mounting point for a tripod using $^{3}/_{8}$" tripod screws.

Display/menu operation block

Used to switch the monitor display between the subdisplay and the viewfinder, and to operate the menus.

For details on menu operations, see "3-3-1 Basic Operation of the Subdisplay" (page 24) and "3-4 VF Menu Basic Operation" (page 32).



❶ VF DISPLAY (viewfinder display) button
Displays the status screen on the viewfinder and monitor.

For details about the information displayed, see "3-7 Viewing and Setting the Viewfinder Display" (page 35).

❷ VF MENU (viewfinder menu) button
Displays the menu screen on the viewfinder and monitor.

❸ Subdisplay
Displays the camera configuration settings. Press and hold the SETTING button (1 second or longer) to enter Settings Change mode.

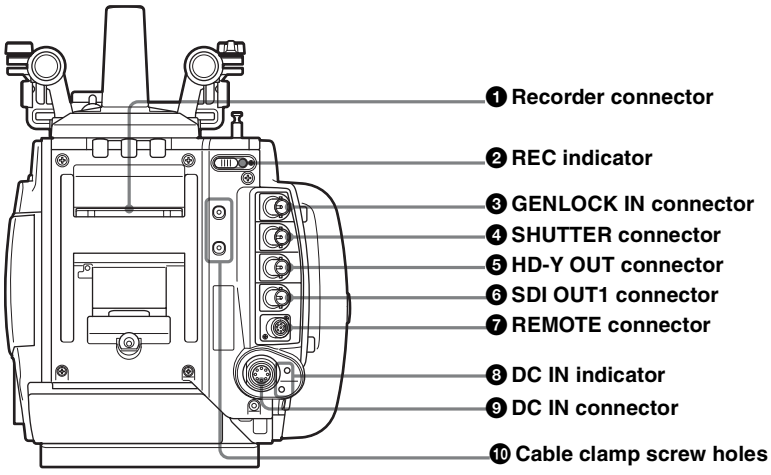
❹ SETTING button
Press and hold for 1 second or longer to enter Settings Change mode to change camera settings using the subdisplay.

❺ PAGE button
Displays the next page when the subdisplay is in Settings Change mode.

❻ BACK button
Cancels changes and returns to the previous screen when the subdisplay is in Settings Change mode or when displaying the menu in the viewfinder or on a monitor.

❼ MENU SEL (selection)/ENTER dial
Turn the dial to select items and press to enter when the subdisplay is in Settings Change mode or when displaying the menu in the viewfinder or on a monitor.

Rear panel



❶ Recorder connector
Connects signal and power with the SR-R4 docked on the camera.

Note

Attach the connector cap on the optical connector when not connected to an SR-R4 to protect the connector.

❷ REC (record) indicator
The indicator is lit red while the recorder is recording. You can slide the cover to hide the indicator.

❸ GENLOCK IN (external sync signal input) connector (BNC type)
Used for input of an external gen-lock signal (HD 3-level sync).

❹ SHUTTER (external shutter) connector
It is not used in this version.

❺ HD-Y OUT connector
Outputs the Y-signal for the HD analog component signal. Used to synchronize external analog equipment.

❻ SDI OUT1 (SDI output 1) connector (BNC type)
Outputs an HD-SDI signal for connection to a monitor.

❼ REMOTE connector (8-pin)
It is not used in this version.

❽ DC IN (DC power input) indicator
A 10.5 V to 17 V indicator and 20 V to 30 V indicator are provided. When the CAM POWER switch is turned ON, the corresponding indicator lights up according to the voltage of the power source.

❾ DC IN connector (LEMO 8-pin)
Connects to a power cable with the supplied power cable connector.

For details, see "2-6 Preparing the Power Supply" (page 21).

❿ Cable clamp screw holes
Can be used to attach the supplied cable clamp.
There are also screw holes on the upper surface on the left panel side.

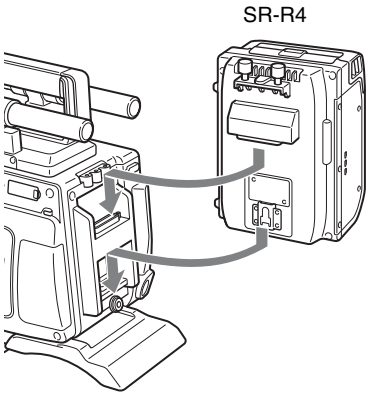
Installation and Preparations

Chapter 2

2-1 Mounting the SR-R4

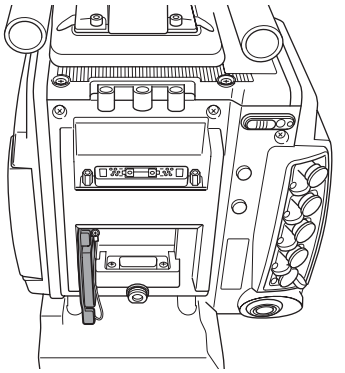
The SR-R4 docks on the rear of the camera head.

For details about mounting the SR-R4, refer to the Operation Manual of the SR-R4.



Notes

- Always turn off the camera power supply when mounting the SR-R4.
- The recorder connector for connecting the SR-R4 is an optical connector. Attach the connector cap on the optical connector when not connected to an SR-R4 to protect the connector. After removing the cap, store it in the position shown in the following figure for safekeeping.



- When mounting the SR-R4, fix the camera head on a tripod in advance to keep the camera head stable.

  For tripod mounting, see "2-4 Mounting the Camera on a Tripod" (page 20).

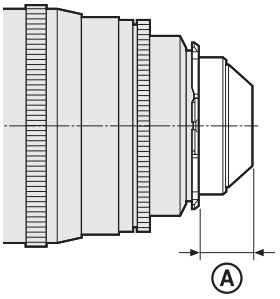
- When the camera is used with the SR-R4 docked, make sure that the camera is securely fixed and stable so that it will not fall over.

2-2 Attaching a Lens

Attach a lens that conforms to the PL lens mount.

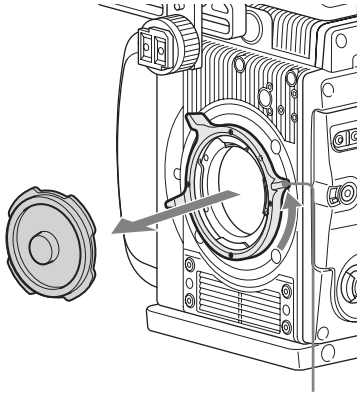
Note

Always use a lens whose projection from the flange (Ⓐ in the figure) is less than 31.5 mm (1 1/4 inch). Use of any lens that protrudes more than 31.5 mm (1 1/4 inch) will damage the internal filter.



For information on handling lenses, refer to the operation manual for the lens.

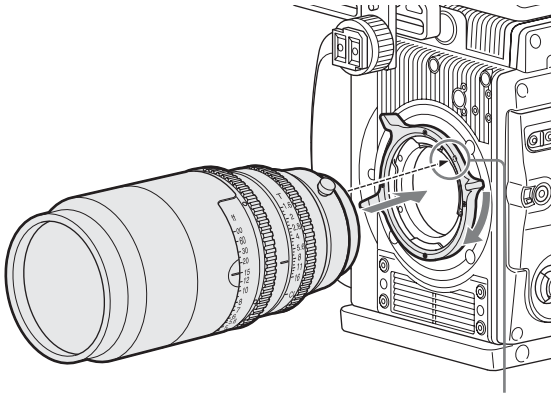
1 Rotate the lens fixing lever counterclockwise and remove the lens mount cap from the lens mount.



Lens fixing lever

2 Align the lens' alignment pin with the notch in the upper part of the lens mount and insert the lens into the mount.

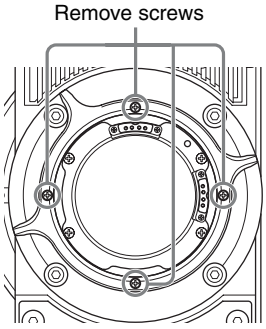
3 While supporting the lens, rotate the lens fixing lever clockwise to secure the lens.



Lens alignment pin

Changing the position of the lens fixing lever

Remove the four screws from the face of the lens fixing lever indicated in the figure. Change the position of the fixing lever, reinsert the screws and securely tighten.



Adjusting the flange focal length

The optical section uses materials not susceptible to thermal expansion, so flange back adjustment is generally not required. However, if you want to make an adjustment, remove the lens mount and replace the shim with one of the appropriate thickness. At shipment, a 0.05 mm (0.0020 inch) shim is installed. The following replacement shims are available.

For information about replacing shims, consult your local Sony representative.

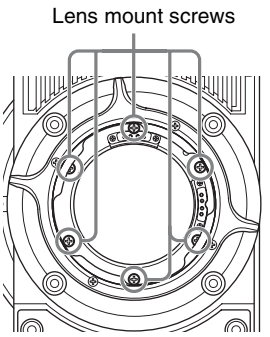
Part number	Thickness
4-260-711-03	0.02 mm (0.0008 inch)
4-260-711-13	0.03 mm (0.0012 inch)
4-260-711-23	0.04 mm (0.0016 inch)
4-260-711-33 (standard)	0.05 mm (0.0020 inch)
4-260-711-43	0.06 mm (0.0024 inch)
4-260-711-53	0.07 mm (0.0028 inch)
4-260-711-63	0.08 mm (0.0032 inch)
4-260-711-73	0.09 mm (0.0036 inch)
4-260-711-83	0.10 mm (0.0040 inch)

To change a shim

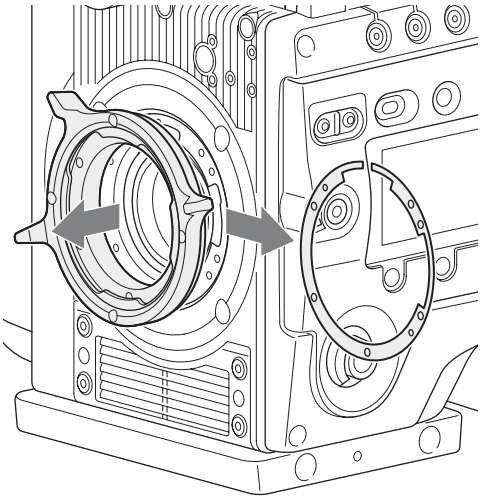
Note

Exercise care not to damage the internal wiring of the camera when changing the shim. Modifying a shim, scratching a surface, or introducing dust can change the flange back distance and damage the camera such that it cannot be restored to original condition, just as for a film camera.

1 Remove the lens mount screws (6).



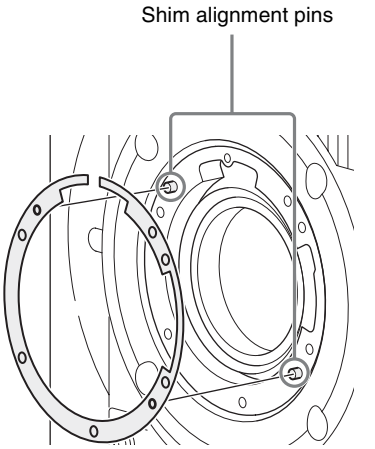
2 Pull the lens mount out by about 10 mm ($^{13}/_{32}$ inch) and remove the shim carefully.
Pass the shim slit over the wiring, taking care not to pull the wiring, when removing the shim.



Note

Pulling the lens mount out by more than 20 mm ($^{3}/_{4}$ inch) risks damage to the internal wiring.

3 Insert the replacement shim using the shim slit to clear the wiring, and align the camera screw holes and shim alignment pins.



4 Reattach the lens mount in its original position, and fasten the screws to a torque of 0.53 N·m (0.39 lbf).

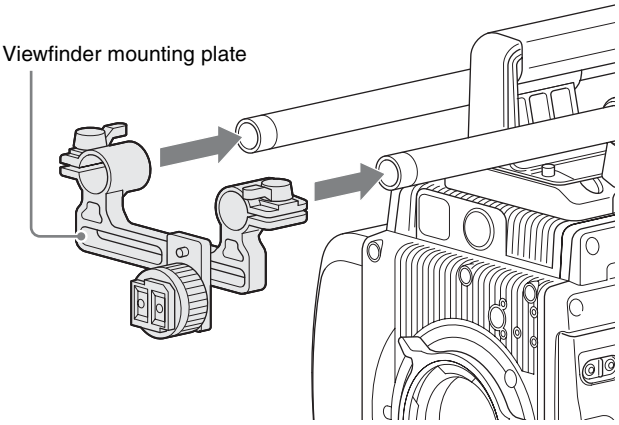
2-3 Attaching a Viewfinder

Caution

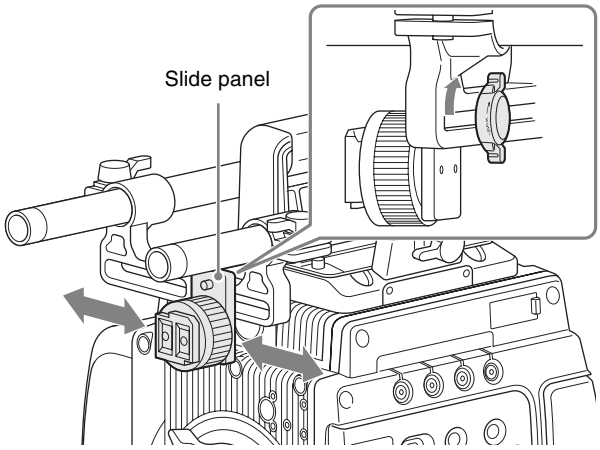
When the viewfinder is attached, do not leave the camera with the eyepiece facing the sun. Direct sunlight can enter through the eyepiece, be focused in the viewfinder and cause fire.

For details on the viewfinder, refer to the instruction manual of the viewfinder.

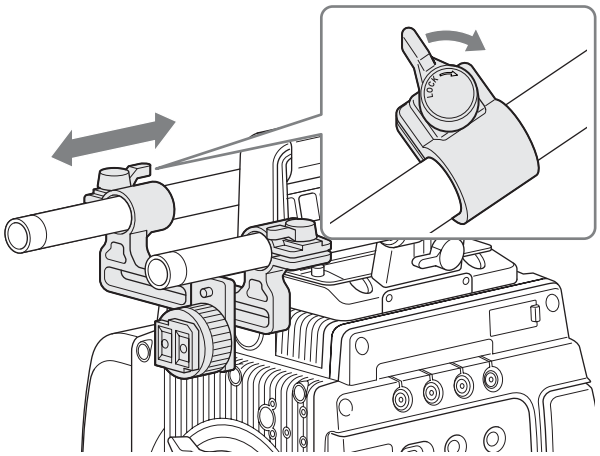
1 Pass the viewfinder mounting plate over the two rods.



2 Slide the slide panel left/right into position, and then turn the lever on the rear of the slide panel to lock it into position.

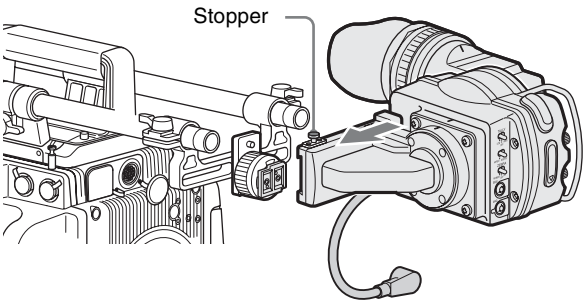


3 Slide the viewfinder mounting plate forward/backward into position, and then turn the lever to lock it into position.

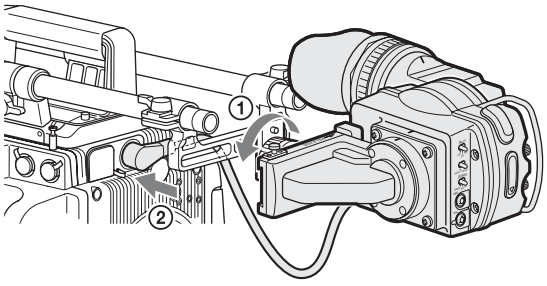


4 Fit the viewfinder to the viewfinder shoe and slide the viewfinder horizontally.

The viewfinder stopper automatically pops down.



5 Set the viewfinder to the most convenient position, tighten the viewfinder positioning ring (① in the figure below), and connect the viewfinder cable to the VF connector of the camera (② in the figure below).



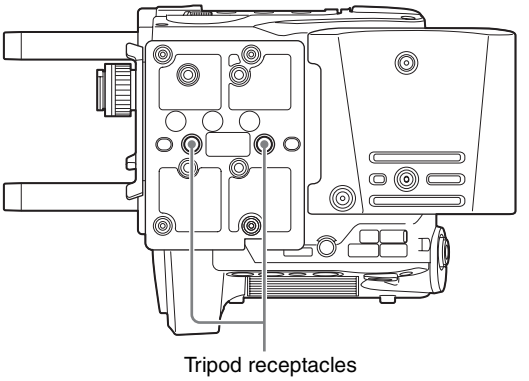
To detach the viewfinder

Loosen the viewfinder positioning ring, pull up the viewfinder stopper, then pull out the viewfinder by sliding it in the direction opposite than when attaching.

2-4 Mounting the Camera on a Tripod

The camera mounts on a tripod using two $^{3}/_{8}$" tripod receptacles that fit into the base of the camera head.

For details about mounting on a tripod, refer to the operation manual of the tripod.



Notes

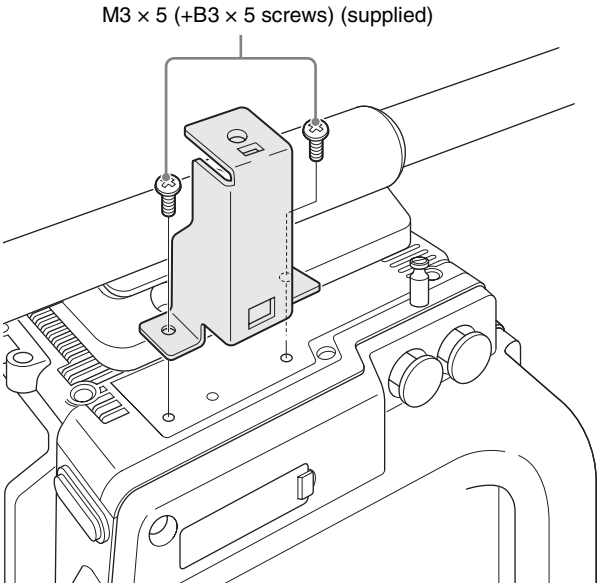
- Select an appropriate hole, considering the balance of the weight of the camera. If an inappropriate hole is selected, the camera may fall over.
- Check that the size of the selected hole matches that of the screw of the tripod. If they do not match, the camera cannot be attached to the tripod securely.

2-5 Mounting the CBK-WA01

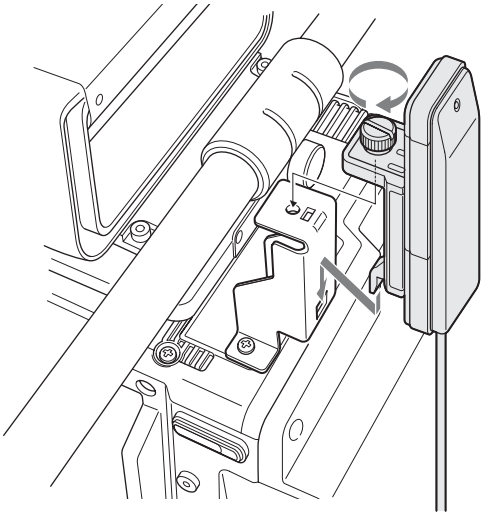
A CBK-WA01 Wi-Fi Adapter can be mounted on the camera using an optional Wi-Fi mounting bracket (part number: 4-418-596-01) for connecting Wi-Fi capable devices to the camera.

For information about obtaining the Wi-Fi mounting bracket, consult your local Sony representative.

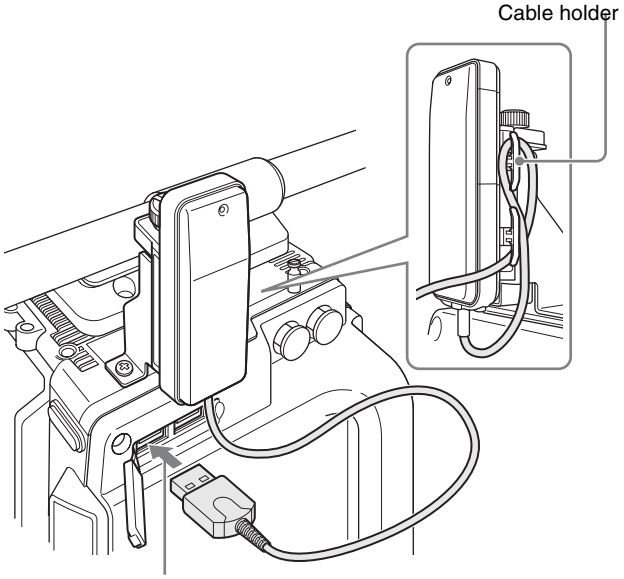
1 Attach the Wi-Fi mounting bracket onto the camera using the supplied +B3 × 5 screws.



2 Place the protrusions on the rear of the CBK-WA01 into the holes in the mounting bracket, and fasten the screw to secure the CBK-WA01 to the bracket.



3 Connect the CBK-WA01 cable to a USB connector on the camera. Wrap excess cable length around the cable holder.



2-6 Preparing the Power Supply

This camera operates at 12 V DC (10.5 V to 17 V).
To supply power to the camera, attach the supplied 8-pin power cable connector to a commercially available shielded cable, and then connect the cable to the DC IN connector (LEMO 8-pin) on the camera.

For details on connector pin assignments, see "Connector Pin Assignments" (page 57) in the Appendix. For details on the pin connections, consult your local Sony representative.

Notes

- Use of a power supply with 150 W or higher supply capacity is recommended to safely drive the camera. The specifications for the power supply cable should be chosen such that the voltage drop is less than 2 V. Example: If a 5-meter (16 ft 5 in.) AWG 18 × 3 cable is used to supply the camera and SR-R4, the voltage drop will be 0.5 to 1.0 V.
- If using the camera's 24 V DC output to drive peripherals, 12 V DC and 24 V DC power supplies must be connected to the camera via the DC IN connector (LEMO 8-pin) of the power cable (supplied).
- When using the SR-R4 docked on the camera, the connection of a 13 V to 17 V DC power source is recommended.

To turn on the camera

Set the CAM POWER switch to the ON position, and the camera is turned on.
Power is also supplied to viewfinder connected to the VF connector.
12 V or 24 V power can be fed to accessories via the DC OUT connectors. To supply 24 V power to accessories, 12 V and 24 V DC input power supplies must be connected via the DC IN connector of the camera.

For the pin assignment for the 24 V power supply DC IN connector, see "Connector Pin Assignments" (page 57) in the Appendix.

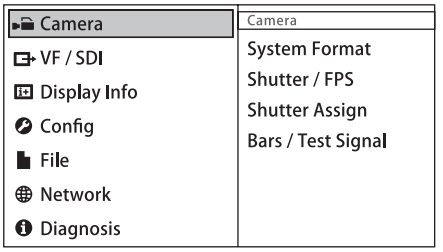
2-7 Setting the Date and Time

When the camera is used for the first time, the menu for setting the date and time is displayed in the viewfinder. Set the current date and time on the <Date/Hour Meter> page in the Config menu.
To set the menu using a monitor screen, connect a monitor to an SDI OUT connector.

1 Turn on the camera power supply.

2 Press the VF MENU button.

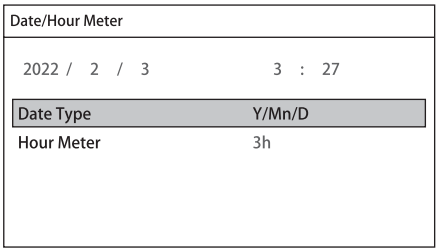
The menu appears in the viewfinder.



3 Turn the MENU SEL/ENTER dial to select Config, then press the MENU SEL/ENTER dial.

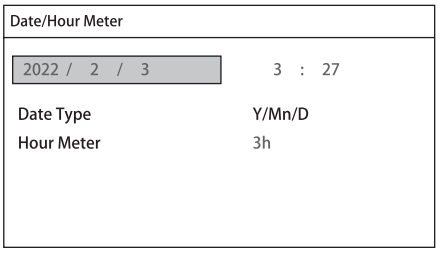
4 Turn the MENU SEL/ENTER dial to select Date/Hour Meter, then press the MENU SEL/ENTER dial.

The <Date/Hour Meter> page appears.



5 Turn the MENU SEL/ENTER dial to select Date, then press the MENU SEL/ENTER dial.

The date becomes editable.



6 Turn the MENU SEL/ENTER dial to set the date (year, month, day).

Turning the MENU SEL/ENTER dial moves to the next digit. Select the day, then press the MENU SEL/ENTER dial to confirm the setting.

7 Turn the MENU SEL/ENTER dial to select Time, then press the MENU SEL/ENTER dial.

The time becomes editable.

8 Turn the MENU SEL/ENTER dial to set the time, then press the MENU SEL/ENTER dial.

9 Turn the MENU SEL/ENTER dial to select Date Type, then press the MENU SEL/ENTER dial.

10 Turn the MENU SEL/ENTER dial to select the date format, then press the MENU SEL/ENTER dial.

You can select one of the following display formats.

Setting	Example display (18th December, 2011)
Y/Mn/D	2011/12/18
Mn/D	12/18

11 When finished, press the VF MENU button to exit menu operation.

Chapter 3 Basic Adjustments and Settings

3-1 Basic Operation of the Camera

The F65 does not perform processing of images on-site, instead you shoot in a mode that presumes images will be processed in post-production, in much the same way you would operate a film camera.

When shooting, the camera gain is fixed and the sensitivity is set using a light meter. The base sensitivity is 800EI, and can be adjusted over a range of ± 2 stops in 1/3 stop increments. When the sensitivity is set to a value higher than the base 800EI, the main camera output signal becomes darker. However, the gain of the images in the viewfinder and on the monitor connected to the SDI OUT connector are automatically adjusted in response to the sensitivity setting to provide appropriate monitoring capability while shooting.
The full latitude does not change when the sensitivity setting is changed, but the dynamic range and noise floor changes in post-production with suitable processing. When the sensitivity is set high, the dynamic range increases on one hand, while the noise in dark areas also increases. Conversely, when the sensitivity is set low, the dynamic range decreases but the noise in the dark areas also decreases.

The white balance can be set to 3200K (tungsten), 4300K (tungsten), or 5500K (daylight).

The camera supports HD mode recording, where images are down-converted to HD internally and recorded on the SR-R4. The recording format can be selected between HD mode and F65RAW mode.

3-2 Camera Settings

The camera can be configured from the following devices.

Subdisplay

You perform the basic setup configuration using the subdisplay on the side of the camera head.
The basic settings (settings page) is displayed on the subdisplay when power is applied to the camera. Press and hold the SETTING button for 1 second or longer to switch to Settings Change mode. The MENU SEL/ENTER dial, SETTING button and BACK button are used for Settings Change mode operation.

For details about settings on the subdisplay, see "3-3 Basic Settings using the Subdisplay" (page 24). For details about the subdisplay menu list, see "4-1 Subdisplay Menu List" (page 38).

Viewfinder or monitor

Detailed settings can be performed by displaying the menu (VF menu) in the viewfinder or on a monitor connected to an SDI OUT connector.
Press the VF MENU button on the side of the camera to display the VF menu in the viewfinder or on a monitor. The VF MENU button, MENU SEL/ENTER dial, and BACK button are used for VF menu operation.

For details about VF menu operations, see "3-4 VF Menu Basic Operation" (page 32). For details about the VF menu list, see "4-2 VF Menu List" (page 40).

Web browser

If the camera is connected to a network, the menus can be displayed in a web browser on a computer. The settings displayed are almost identical to the display in the viewfinder or on a monitor.

For details about web browser operations, see "Menu Operation using a Web Browser" (page 59).

Tablet device

If the camera is used with the optional Wi-Fi adapter (CBK-WA01), the menus can be displayed on a tablet device, such as an iPad, via a wireless LAN. The settings displayed are almost identical to the display in the viewfinder or on a monitor.

For details about tablet device operations, see "Operation using a Tablet Device" (page 60).

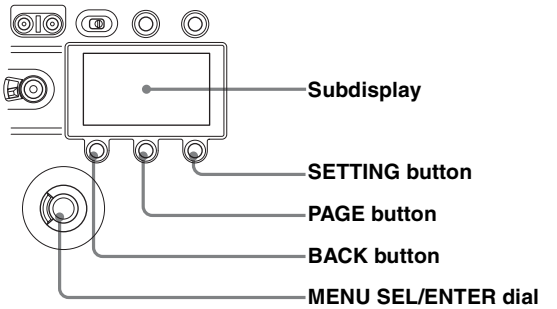
3-3 Basic Settings using the Subdisplay

Basic settings of the camera can be easily performed using the subdisplay. The items set on the subdisplay can also be set using the VF menu.

3-3-1 Basic Operation of the Subdisplay

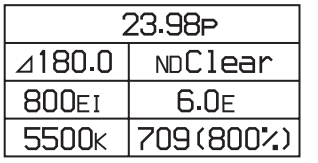
The buttons and dial shown below are used for operation of the subdisplay.

Side panel of the camera head



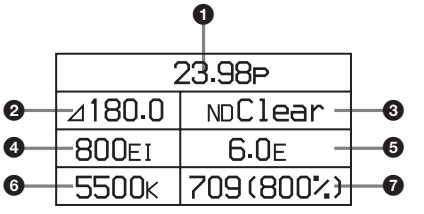
To display the settings pages

After the camera is turned on, the startup screen is displayed on the subdisplay for several seconds, after which the settings page is displayed.



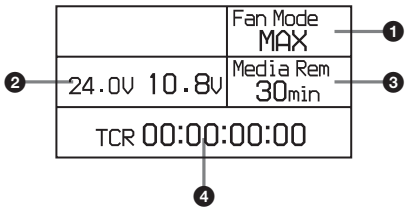
Pressing the PAGE button advances to the next page. The following items can be set or checked on each settings page.

Settings page 1



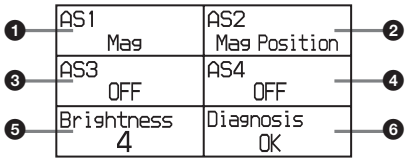
❶ Video format
❷ Shutter value
❸ ND filter
❹ Sensitivity (EI value)
❺ Highlight latitude
❻ Color temperature
❼ Look-up table (LUT)

Settings page 2



❶ Fan operating mode
❷ Voltages
❸ Media remaining
❹ Timecode

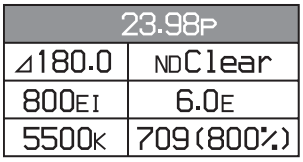
Settings page 3



❶ ASSIGN button 1
❷ ASSIGN button 2
❸ ASSIGN button 3
❹ ASSIGN button 4
❺ Subdisplay brightness
❻ Self diagnostics

To change a setting

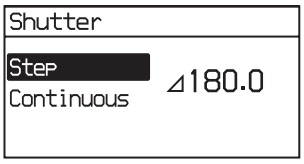
Press and hold the SETTING button for 1 second or longer. The screen changes to Settings Change mode, and the selected item is displayed in inverse text.



In this mode, the item you want to set is selected by turning the MENU SEL/ENTER dial. When the item you want to set is shown in inverse text, press the MENU SEL/ENTER dial.

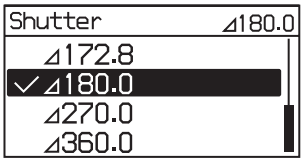
Where there are multiple configuration items, the select screen is displayed.

Select screen (e.g. shutter value)



On this screen, turn the MENU SEL/ENTER dial to select an item. Press the MENU SEL/ENTER dial to display the change screen for the item.

Change screen (e.g. shutter value)



The current value of the setting is displayed at the top right of the screen. Turn the MENU SEL/ENTER dial to select the value, then press the MENU SEL/ENTER dial.
The value for the selected item is entered.

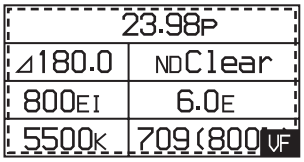
To cancel a changed setting

Press the BACK button before confirming the changed setting.
The setting is restored to the original value, and the display returns to the previous page.

Note

Pressing the VF MENU button enables menu operation in the viewfinder or on a monitor, and disables operation using the subdisplay.

Subdisplay when VF MENU button is pressed



3-3-2 Setting the Video Format

The camera supports the following video format settings.
F65RAW mode
23.98p, 24p, 29.97p, 25p, 59.94p, S59.94p, S60P
HD mode
23.98p, 29.97p, 25p
The mode can be switched between F65RAW mode and HD mode on the <System Format> page in the VF menu.

For details, see "3-5 Setting the Shooting Mode" (page 34).

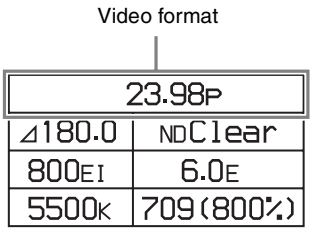
Note

It is recommended that the power be turned off and back on again after changing the video format.

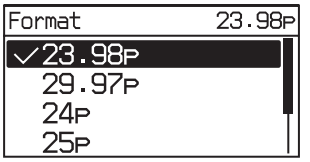
Changing the video format

1 Select the video format on settings page 1, then press the MENU SEL/ENTER dial.

Settings page 1



2 Turn the MENU SEL/ENTER dial to select the video format, and press the MENU SEL/ENTER dial.



To set using the VF menu

Set on the <System Format> page in the Camera menu *(page 41)*.

VF and SDI OUT connectors output format

Setting the camera main video format automatically determines the signal format that is output on the VF and SDI OUT connectors.

Camera image	VF connector output	SDI OUT connector output
23.98p	23.98PsF	23.98PsF
29.97p	29.97PsF	29.97PsF
24p	24PsF	24PsF
25p	25PsF	25PsF
59.94p	59.94i	59.94i
S59.94p	59.94i	59.94i
S60p	60i	60i

3-3-3 Setting the Shutter Value

The shutter of the camera can be viewed and adjusted, with settings displayed as shutter angles, just as for a film camera. Two operation methods are available for the adjustment: stepwise and continuous.

Step mode

Frequently-used shutter angle values can be selected, enabling step selection of the shutter values.

Step No.	Shutter angle
1	360.0[a)]
2	270.0[a)]
3	180.0
4	172.8
5	150.0
6	144.0
7	90.0
8	45.0
9	22.5
10	11.2

a) Selectable for the electronic shutter only.

The corresponding shutter speeds vary according to the frame frequency and frame rate of the selected video format.

Continuous mode (ECS)

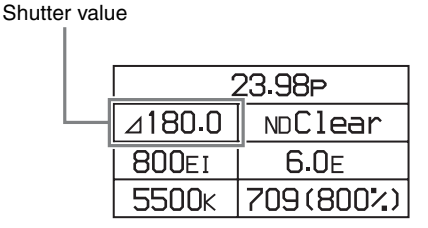
The shutter value can be changed smoothly in continuous mode in the range 4.2° to 360.0° (electronic shutter) or 11.2° to 180.0° (mechanical rotary shutter).
To obtain your desired shutter value quickly, select a value nearest your desired one in Step mode, then switch to Continuous mode and adjust the shutter value.

Changing the shutter value in Step mode

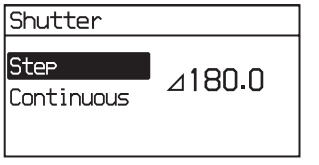
In Step mode, one of the registered shutter values can be selected.

1 Select the shutter value on settings page 1, then press the MENU SEL/ENTER dial.

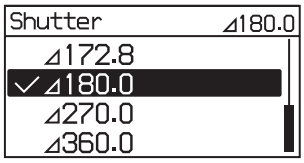
Settings page 1



2 Select [Step], then press the MENU SEL/ENTER dial.



3 Turn the MENU SEL/ENTER dial to select the shutter value.



Pressing the MENU SEL/ENTER dial confirms the setting, and reflects the changed value on the camera. Pressing the BACK button cancels the shutter setting, and restores the previous value.

To set using the VF menu

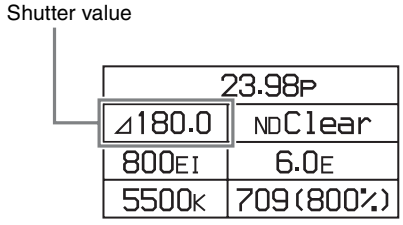
Set on the <Shutter/FPS> page in the Camera menu *(page 41)*.

Selecting an arbitrary shutter value

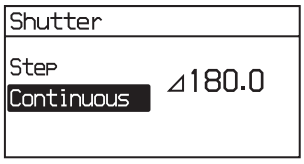
In Continuous mode, an arbitrary shutter value can be set.

1 Select the shutter value on settings page 1, then press the MENU SEL/ENTER dial.

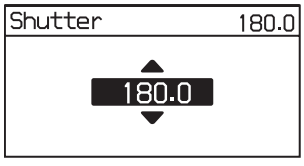
Settings page 1



2 Select [Continuous], then press the MENU SEL/ENTER dial.



3 Turn the MENU SEL/ENTER dial to select the shutter value.



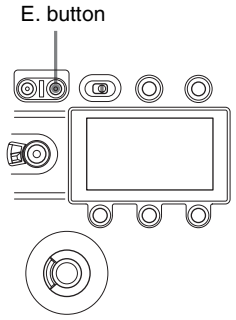
You do not need to press the MENU SEL/ENTER dial to set a value. The shutter value changes are reflected on the camera as the MENU SEL/ENTER dial is turned. Pressing the BACK button cancels the shutter setting, and restores the previous value.

To set using the VF menu

Set on the <Shutter/FPS> page in the Camera menu *(page 41)*.

When not using the shutter

Press the “E.” button if the E. button indicator on the SHUTTER button is on.
The shutter is switched off, and the E. button indicator turns off.



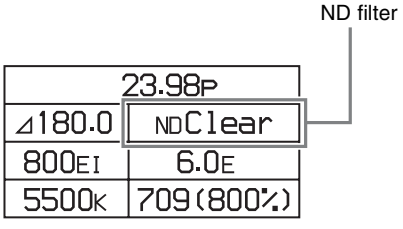
3-3-4 Selecting an ND Filter

The camera has built-in optical ND filters that can be used to match the illumination and natural lighting conditions. The following filters can be selected.

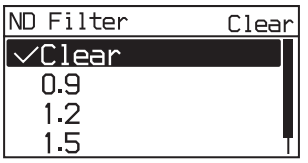
Filter density	Description
Clear	No filter is used.
0.9	1/8 optical transmittance
1.2	1/16 optical transmittance
1.5	1/32 optical transmittance
1.8	1/64 optical transmittance

1 Select the ND filter on settings page 1, and press the MENU SEL/ENTER dial.

Settings page 1



2 Turn the MENU SEL/ENTER dial to select the ND filter, then press the MENU SEL/ENTER dial.



To set using the VF menu

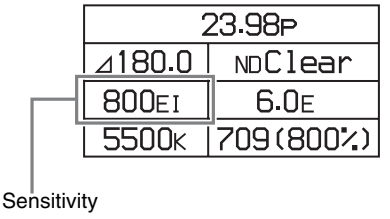
Set the ND Filter on the <Base Setting> page in the Camera menu *(page 41)*.

3-3-5 Setting the Sensitivity (EI Value)

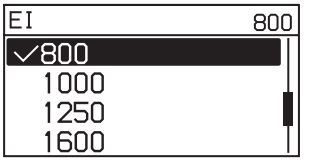
The sensitivity is determined by the EI value (Exposure Index). The viewfinder and monitor image brightness changes to match the EI value. But it has no affect on the recorded image.
The camera supports the following sensitivity settings: 200EI, 250EI, 320EI, 400EI, 500EI, 640EI, 800EI, 1000EI, 1250EI, 1600EI, 2000EI, 2500EI, and 3200EI.

1 Select the sensitivity on settings page 1, then press the MENU SEL/ENTER dial.

Settings page 1



2 Turn the MENU SEL/ENTER dial to select the EI value, then press the MENU SEL/ENTER dial.



To set using the VF menu

Set the Exposure Index on the <Base Setting> page in the Camera menu *(page 41)*.

3-3-6 Checking the Highlight Latitude

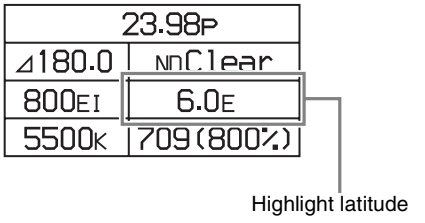
The highlight latitude can be checked on settings page 1 on the subdisplay.

The latitude is automatically assigned one of the following values, depending on the sensitivity (EI value) setting. The assigned value varies depending on the mode (F65RAW or HD) and the gamma setting.

Sensitivity (EI value)	Latitude	
	F65RAW HD (S-log2)	HD (S-log1)
200EI	4.0E	3.5E
250EI	4.4E	3.9E
320EI	4.7E	4.2E
400EI	5.0E	4.5E
500EI	5.4E	4.9E
640EI	5.7E	5.2E
800EI	6.0E	5.5E
1000EI	6.4E	5.9E
1250EI	6.7E	6.2E
1600EI	7.0E	6.5E
2000EI	7.4E	6.9E
2500EI	7.7E	7.2E
3200EI	8.0E	7.5E

The value is displayed in “xxE” format and represents the highlight latitude displayed as a lens aperture value (f-stop) for key light from a gray chart with 18% reflectivity.

Settings page 1

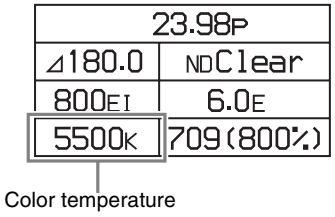


3-3-7 Setting the Color Temperature

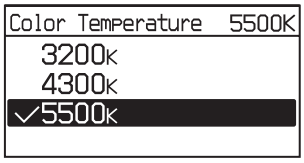
The color temperature can be set to 3200K (tungsten), 4300K (tungsten), or 5500K (daylight) to match the shooting environment.

1 Select the color temperature on settings page 1, then press the MENU SEL/ENTER dial.

Settings page 1



2 Turn the MENU SEL/ENTER dial to select the color temperature, then press the MENU SEL/ENTER dial.



To set using the VF menu

Set the Color Temperature on the <Base Setting> page in the Camera menu *(page 41)*.

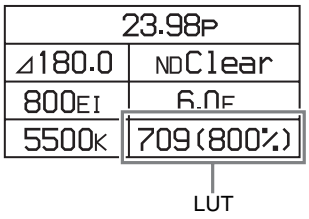
3-3-8 Setting the SDI OUT Output LUT

The image output from the SDI OUT connectors is configured using a Look-up table (LUT). The images shot with the camera are intended for processing in post-production, and are not suitable for checking the results of shooting as-is on the scene. Setting a LUT changes the tone of the image displayed on a monitor connected to an SDI OUT connector, without affecting the main RAW image output, for ease of monitoring. The LUTs that can be configured vary depending on the RAW/HD setting on the <System Format> page and the Gamma setting on the <Base Setting> page in the VF menu.

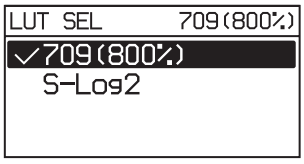
Setting	Description
Off	No LUT is configured.
709(800%) (default)	Outputs a signal that extends the dynamic range by up to 800% in video terms based on ITU-R709 with conventional monitor gamma.
S-Log1	Outputs a non-adjustable signal that uses S-Log gamma. Up to 1000% input light level can be reproduced. This option is available when Gamma is set to S-Log1 in HD mode.
S-Log2	Outputs a non-adjustable signal that uses S-Log gamma. Up to 1300% input light level can be reproduced. This option is available in F65RAW mode and when Gamma is set to S-Log2 in HD mode.

1 Select the monitor look-up table on settings page 1, then press the MENU SEL/ENTER dial.

Settings page 1



2 Turn the MENU SEL/ENTER dial to select the look-up table to apply, then press the MENU SEL/ENTER dial.



To set using the VF menu

Set on the <LUT> page in the VF/SDI menu *(page 42)*.

3-3-9 Selecting the Fan Operating Mode

You can set the operating mode of the camera's built-in fans. The mode can be set to silence the fan speed noise or to provided maximum cooling to suit the shooting environment. You can select one of the following operating modes.

Setting	Fan operation
Auto1	The fans are automatically controlled according to the internal temperature, regardless of whether recording or not.
Auto2 (default)	The fans are automatically controlled according to the internal temperature. When recording, the fans are controlled to maintain quiet operation.[a)]
Min	In this mode, quiet fan operation is maintained regardless of whether recording or not. This is the best mode if recording for more than 30 minutes in a quiet environment, such as a concert hall. Use this mode in environments with ambient temperature of less than 30°C (86°F).
Max	Fan rotation set at the maximum speed to lower the internal temperature.

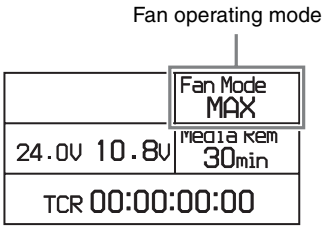
a) The coupling of the fan control with recording is available only when an SR-R4 is docked on the camera.

Note

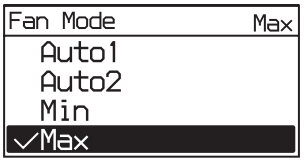
Even when Min mode is selected, the speed of the fans automatically increases if the internal temperature rises.

1 Select the fan operating mode on settings page 2, then press the MENU SEL/ENTER dial.

Settings page 2



2 Turn the MENU SEL/ENTER dial to select the operating mode, then press the MENU SEL/ENTER dial.



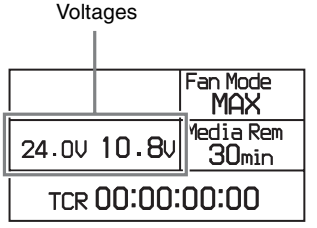
To set using the VF menu

Set on the <Fan Mode> page in the Config menu *(page 44)*.

3-3-10 Checking the Voltage

The voltage of the power supplies connected to the camera can be checked on settings page 2 on the subdisplay.

Settings page 2



The voltage of the 24 V supply is displayed on the left, and the voltage of the 12 V supply on the right. If power is not supplied, "- -" is displayed.
If the voltage falls to the Near End level, the voltage indicator starts flashing. If the voltage falls to the End level, the indicator starts flashing rapidly.

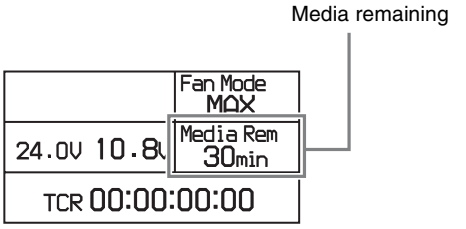
The voltage Near End and End levels can be set on the <Battery Alarm> page in the Config menu *(page 44)*.

For details, see "3-7-3 Setting the Voltage Warning Values" (page 36).

3-3-11 Checking the Remaining Media

When the SR-R4 recorder is docked with the camera, an estimate of the remaining recording time (in minutes) on the memory card can be checked on settings page 2 on the subdisplay.

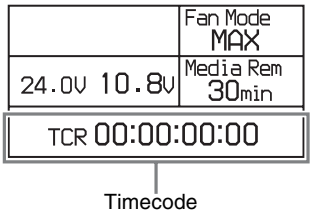
Settings page 2



3-3-12 Checking the Timecode

When the SR-R4 recorder is docked with the camera, the SR-R4 timecode can be checked on settings page 2 on the subdisplay.

Settings page 2



Time code display types

Indication	Meaning
TCG 00:00:00:00	Time code generator's time code data. DF or NDF is displayed, depending on the time code type.
TCR 00:00:00:00	LTC or VITC reader time code data. LTC or VITC is displayed on the right. Also, DF or NDF is displayed, depending on the time code type.
UBG 00 00 00 00	Time code generator's user bit data.
UBR 00 00 00 00	LTC or VITC reader user bit data. LTC or VITC is displayed on the right.
TM1 00:00:00:00	Timer1 timer value.
TM2 00:00:00:00	Timer2 timer value.

3-3-13 Assigning Functions to the ASSIGN Buttons

Separate functions can be assigned to each of the ASSIGN buttons 1 to 4 on the side of the camera body.
The following functions are assigned to the buttons by factory default.

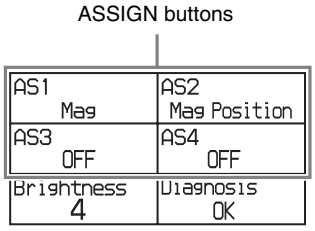
Button	Function
ASSIGN 1	Mag
ASSIGN 2	Mag Position
ASSIGN 3	Hi/Lo Key
ASSIGN 4	Rec Review

Functions that can be allocated to the ASSIGN buttons

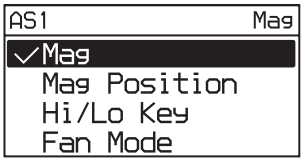
Menu indication	Function
OFF	No function is allocated.
Mag	Displays a magnified image in the viewfinder and on the SDI OUT connectors. Each time the button is pressed, the magnification changes between 2-times, 4-times, and Off. When the magnification is 2-times or 4-times, the ASSIGN button allocated with the Mag function is lit. The display returns to normal after about 30 seconds.
Mag Position	Selects the position of the image that is magnified by the Mag function. There are nine points on the screen that can act as the center point of the magnified image. This function sets the position of the magnified image as an area centered on one of these points. Each time the button is pressed, the area moves one position from top left to bottom right. When the display is magnified, the ASSIGN button allocated with the Mag Position function is lit.
Hi/Lo Key	Temporarily changes LUT for checking the high-luminance brightness and low-luminance darkness of the image in the viewfinder and from the SDI OUT connectors. The button toggles between high-luminance check (gain reduction), low-luminance check (gain amplification), and normal. The display returns to normal after about 30 seconds.
Fan Mode	Switches the fan operating mode. *For details on the fan operating mode, see "3-3-9 Selecting the Fan Operating Mode" (page 29).*
Rec Review	Plays the video just recorded. The playback interval (all or the last five seconds) follows the setting in the SR-R4 menu.
Bars	Outputs color bars. Can be assigned to ASSIGN 4 only.

1 Select AS1 to AS4 for the button you wish to assign on settings page 3, then press the MENU SEL/ENTER dial.

Settings page 3



2 Turn the MENU SEL/ENTER dial to select the function to assign, then press the MENU SEL/ENTER dial.



To set using the VF menu

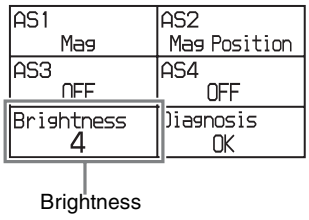
Set on the <Switch Assign> page in the Config menu *(page 44)*.

3-3-14 Adjusting the Subdisplay Brightness

The brightness of the subdisplay can be adjusted to one of four levels.

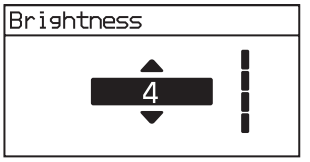
1 Select Brightness on settings page 3, then press the MENU SEL/ENTER dial.

Settings page 3



2 Turn the MENU SEL/ENTER dial to adjust the brightness, then press the MENU SEL/ENTER dial.

The higher the value, the brighter the subdisplay.



3-3-15 Checking the Self-Diagnostic Results

The results of self-diagnostics can be checked on settings page 3. If an internal error occurs, a warning or error message is displayed.

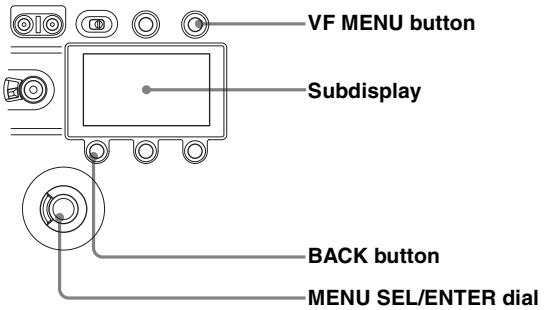
For details about messages, see "Warning/Error Messages" (page 50).

AS1 Mag	AS2 Mag Position
AS3 OFF	AS4 OFF
Brightness 4	Diagnosis OK

3-4 VF Menu Basic Operation

Detailed settings that cannot be configured on the subdisplay are set in the VF menu displayed in the viewfinder or on a monitor.
The VF MENU button, MENU SEL/ENTER dial, and BACK button on the side panel of the camera head are used to operate the VF menus.
The MENU SEL/ENTER dial has a knob that you turn to select items (MENU SEL) and a button you press to confirm values for items (ENTER).

Side panel of the camera head



While the subdisplay is in Change mode, menu operations in the viewfinder or on a monitor cannot be performed.

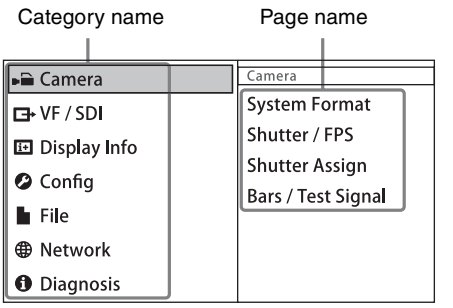
For more information about settings on the subdisplay, see "3-3 Basic Settings using the Subdisplay" (page 24).

To display the settings screen

1 Press the VF MENU button.

The top menu screen appears. Categories are displayed on the left, and pages contained within that category are displayed on the right.

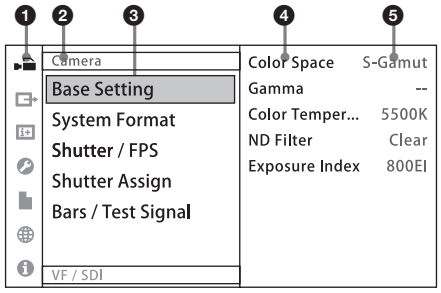
Top menu screen



2 Turn the MENU SEL/ENTER dial to select a category, then press the MENU SEL/ENTER dial.

The page select screen appears. Items within the selected page and the current values of those items are displayed. You can check the items and their values on each page by turning the MENU SEL/ENTER dial. Pressing the BACK button returns to the top menu screen.

Page select screen

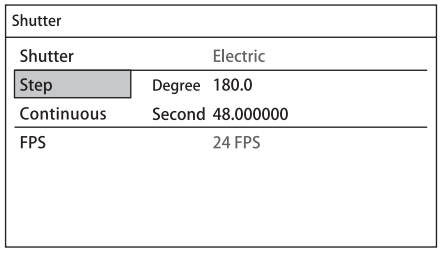


❶ Category icon
❷ Category name
❸ Page name
❹ Configuration item
❺ Current value

3 Turn the MENU SEL/ENTER dial to select a page, then press the MENU SEL/ENTER dial.

The settings screen appears. Pressing the BACK button returns to the Page select screen.

Settings screen



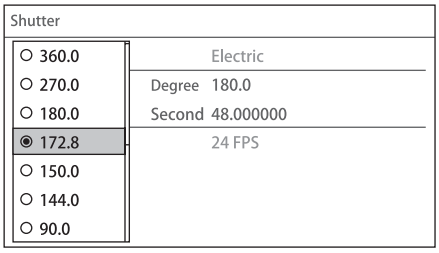
To change a setting

1 Turn the MENU SEL/ENTER dial to move to the desired item.

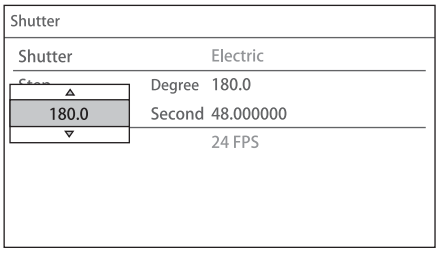
2 Press the MENU SEL/ENTER dial.

The list or spin box corresponding to the selected item is displayed.

Screen Example (List)



Screen Example (Spin box)



3 Turn the MENU SEL/ENTER dial to select a value for the item.

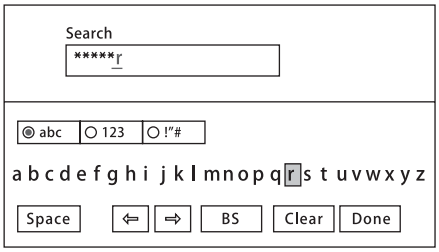
To cancel a setting

Pressing the BACK button while the operating screen is displayed cancels the operation and restores the current value.

4 Press the MENU SEL/ENTER dial to confirm the setting.

To enter a character string

You use a keyboard displayed on the screen to enter file names, passwords, and other text.



The string is displayed in the upper text box as you enter each character.
Turn the MENU SEL/ENTER dial to select the Done button, then press the MENU SEL/ENTER dial to confirm the entered character string.

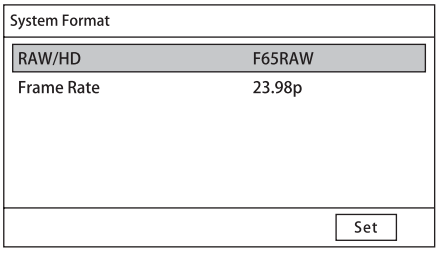
To exit the menu

Press the VF MENU button.

3-5 Setting the Shooting Mode

The shooting mode can be set to RAW mode or HD mode. You select the mode on the <System Format> page of the Camera menu *(page 41)*. You can also set the frame rate and the encoding on the <System Format> page.

<System Format> page



RAW/HD

Selects the shooting mode.

F65RAW: Records 16-bit linear RAW data.

HD: Develops RAW data to HD internally, and records HD data.

Frame Rate

Selects the frame rate. The frame rates that can be selected vary depending on the RAW/HD mode selection. For details about the frame rates that can be selected, see *"3-3-2 Setting the Video Format" (page 25)*.

Signal Mode

Selects the signal format in HD mode. 4:4:4 RGB or 4:2:2 YCbCr can be selected.
This setting is not configurable in F65RAW mode.

To enable a setting

1. Select each parameter on the <System Format> page, select Set, and then press the MENU SEL/ENTER dial.
2. After confirming the setting in the confirmation dialog, select Execute, then press the MENU SEL/ENTER dial.

   The settings are reflected on the camera.

3-6 Setting the Output Signal

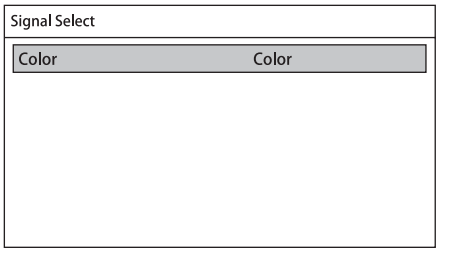
3-6-1 Selecting the Output Video Signal

The type of video signals to be output on the SDI OUT and VF connectors can be selected. The settings are common to each connector.
You select the signal on the <Signal Select> page in the VF/SDI menu *(page 42)*.

Output signal when connected to SR-R4

The SR-R4 playback image is automatically output when playback is started on the SR-R4. When playback is stopped on the SR-R4, the output reverts to the camera image.

<Signal Select> page



Color

Selects the output channel.

Color: Outputs all RGB channels.

R: Outputs the R channel only.

G: Outputs the G channel only.

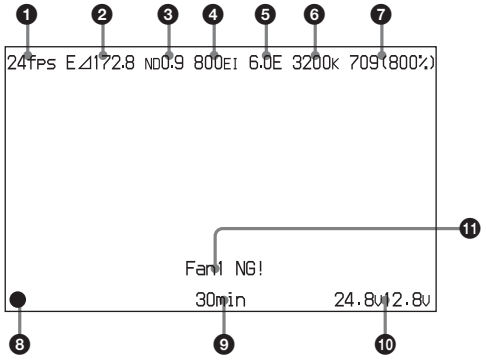
B: Outputs the B channel only.

3-7 Viewing and Setting the Viewfinder Display

Besides the video image, the viewfinder can display text and messages showing the camera settings and operation status.
The same information can be displayed on a monitor connected to the SDI OUT connector.

3-7-1 Viewing the Basic Status Display

The following status information is displayed in the viewfinder when you press the VF DISPLAY button.
The display status can be specified on the <Status1> and <Status2> pages in the Display Info menu *(page 43)*.



❶ Frame rate
Displays the current frame rate.

❷ Shutter angle
Displays the shutter value as a shutter angle.
When using an electronic shutter, “E” is displayed before the angle. When using a mechanical rotary shutter, “R” is displayed.

❸ ND filter
Displays the type of ND filter currently selected.

❹ Sensitivity
Displays the currently set sensitivity as an EI value.

❺ Highlight latitude
Displays the latitude for highlights relative to an 18% gray chart.

❻ Color temperature filter mode
Indicates the state of the electrical filter.

❼ Look-up table (LUT)
Displays the file name of the look-up table currently selected.

❽ Recording status indicator
Displays “●” when the SR-R4 docked on the camera is recording.

❾ Media remaining
Displays the approximate number of minutes remaining for the recording media in the SR-R4 docked on the camera.

❿ Power supply voltages
Displays the state of the output voltages. The output from DC 24 V OUT is displayed on the left, and DC 12 V OUT on the right.
The voltage readout begins to flash if the corresponding input voltage falls to the Near End value specified on the <Battery Alarm> page in the Config menu. The indicator flashes more rapidly if the voltage falls to the End value.

⓫ Message area
Displays a warning/error message if an error occurs. The error details are also displayed in the self diagnostics field in settings page 3 on the subdisplay.

For details about messages, see “Warning/Error Messages” (page 50).

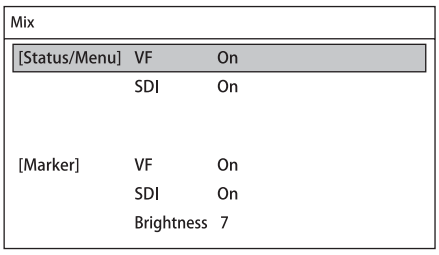
3-7-2 Setting the Marker Display

Various markers can be displayed in the viewfinder and on the monitor.

Turning status/marker display On/Off for each output

You can set whether to display status information and markers in the signal output from the VF and SDI OUT connectors on the <Mix> page in the Display Info menu *(page 43)*.

<Mix> page



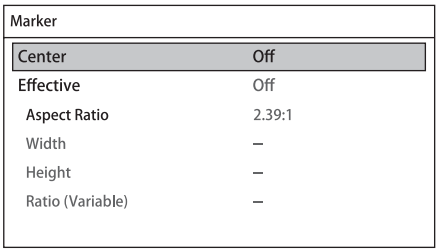
The default setting is to display status information and markers in the signals from the VF and SDI OUT connectors.

Item	Setting
[Status/Menu] VF	Sets whether to display status information in the VF connector signal.
SDI	Sets whether to display status information in the SDI OUT connector signal.
[Marker] VF	Sets whether to display markers in the VF connector signal.
SDI	Sets whether to display markers in the SDI OUT connector signal.
Brightness	Sets the marker display brightness in the range 1 to 10 (maximum brightness is 10).

Specifying the markers to display

When the marker display is turned On on the <Mix> page, you select the markers for display on the <Marker> page in the Display Info menu.

<Marker> page



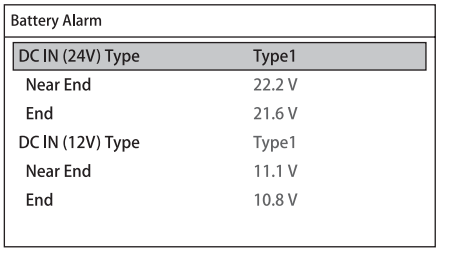
The default setting for all markers is “Off.”

Item	Setting
Center Marker	Sets whether to display the center marker.
Effective	Sets whether to display the effective pixel area.
Aspect Ratio	Selects the aspect ratio when Effective is set to On. The following options are available. 2.39:1, 2.35:1, 1.90:1, 1.85:1, 1.78:1, 1.66:1, 1.33:1, Variable
Width	Specifies the width of the effective pixel area (960 to 1920 pixels) when Aspect Ratio is set to Variable.
Height	Specifies the height of the effective pixel area (540 to 1080 pixels) when Aspect Ratio is set to Variable.
Ratio (Variable)	Displays the aspect ratio in n.mm:1 format when Aspect Ratio is set to Variable.

3-7-3 Setting the Voltage Warning Values

The Near End and End values used to issue battery voltage warnings when the supply voltage drops are set on the <Battery Alarm> page in the Config menu.
Two Near End and End values can be saved, and you can switch between them as required.

<Battery Alarm> page



Item	Setting
DC IN (24V) Type	Selects the 24 V system supply settings. You can set Near End and End threshold values for both Type1 and Type2.
Near End	Sets the 24 V power supply Near End value (20.5 V to 30.0 V). The default is 22.2 V.
End	Sets the 24 V power supply End value (20.0 V to 24.0 V). The default is 21.6 V.
DC IN (12V) Type	Selects the 12 V system supply settings. You can set Near End and End threshold values for both Type1 and Type2.
Near End	Sets the 12 V power supply Near End value (11.0 V to 17.0 V). The default is 11.1 V.
End	Sets the 12 V power supply End value (10.5 V to 14.0 V). The default is 10.8 V.

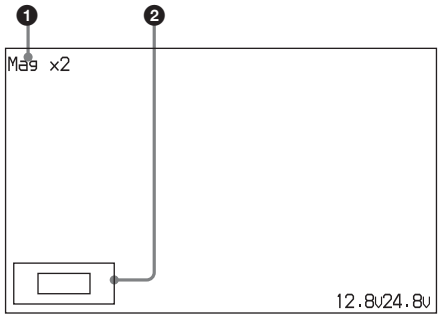
3-7-4 Magnifying the Viewfinder Display

The image displayed in the viewfinder can be magnified by assigning the Mag function to an ASSIGN button. The magnification changes between 2-times, 4-times, and Off each time the ASSIGN button is pressed.
The position of the magnified image displayed in the viewfinder can be adjusted by assigning the Mag Position function to another ASSIGN button. The position of the magnified image moves one step from top left to bottom right each time the ASSIGN button is pressed.

Note

The magnified display returns to normal 30 seconds after pressing the ASSIGN button. Also, the display returns to normal when power is applied and when recording starts.

When the image is magnified, the following information is displayed in the viewfinder.



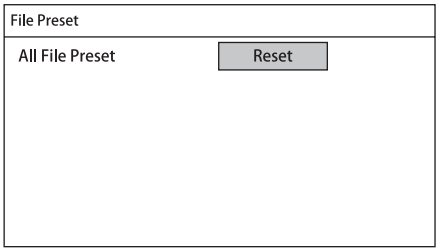
❶ Magnification
When the image is magnified by 2, “Mag x 2” is displayed; when magnified by 4, “Mag x 4” is displayed.

❷ Magnification position
Displays the position of the magnified image.

3-8 Restoring the factory default settings

All camera settings can be restored to their factory default settings by executing the All File Preset command on the <File Preset> page in the File menu *(page 45)*.
Execute the All File Preset command after upgrading software or replacing boards.

<File Preset> page



Menu Configuration and Detailed Settings

Chapter 4

4-1 Subdisplay Menu List

This section describes the menu list displayed on the subdisplay.

Item		Default	Set or display value	Remarks
Settings page 1				
Video format	FPS	N/A	1 to 60	
	Frame rate	23.98p	F65RAW mode: 23.98p, 24p, 29.97p, 25p, 59.94p, S59.94p, S60p HD mode: 23.98p, 29.97p, 25p	
Electronic shutter		180.0	Step: 11.2, 22.5, 45.0, 90.0, 144.0, 150.0, 172.8, 180.0, 270.0, 360.0 Continuous: 4.2 to 360.0	
Mechanical rotary shutter		180.0	Step: 11.2, 22.5, 45.0, 90.0, 144.0, 150.0, 172.8, 180.0 Continuous: 11.2 to 180.0	
ND filter		Clear	Clear, 0.9, 1.2, 1.5, 1.8, Close, Mainte	Close: Filter closed (display only) Mainte: Maintenance mode, with no filter deployed (display only). Switched using the VF menu.
Sensitivity (EI value)		800EI	200EI, 250EI, 320EI, 400EI, 500EI, 640EI, 800EI, 1000EI, 1250EI, 1600EI, 2000EI, 2500EI, 3200EI	
Highlight latitude (display only)		6.0E	F65RAW mode/HD S-log2 mode: 4.0E, 4.4E, 4.7E, 5.0E, 5.4E, 5.7E, 6.0E, 6.4E, 6.7E, 7.0E, 7.4E, 7.7E, 8.0E HD S-log1 mode: 3.5E, 3.9E, 4.2E, 4.5E, 4.9E, 5.2E, 5.5E, 5.9E, 6.2E, 6.5E, 6.9E, 7.2E, 7.5E	Automatically changes according to the sensitivity (EI value) setting.
Color temperature		5500K	3200K, 4300K, 5500K	

Item	Default	Set or display value	Remarks
LUT	709(800%)	Off, 709(800%), S-Log1, S-Log2	S-Log1 is available when Gamma is set to S-Log1 in HD mode. S-Log2 is available in F65RAW mode and when Gamma is set to S-Log2 in HD mode.
Settings page 2			
Fan operating mode	Auto2	Auto1, Auto2, Min, Max	
Voltage (display only)	N/A	0.1 V increments	Displays the voltages of the 12 V and 24 V system power supplies.
Media remaining (display only)	N/A	0 to 999min, --min	Displays the remaining recording time for SR-R4 media.
Timecode (display only)	N/A	TCG, TCR, UBG, UBR, TM1, TM2	Displays the SR-R4 timecode.
Settings page 3			
ASSIGN button 1	Mag	Mag, Mag Position, Hi/Lo Key, Fan Mode, Rec Review, Off	
ASSIGN button 2	Mag Position		
ASSIGN button 3	Hi/Lo Key		
ASSIGN button 4	Rec Review	Mag, Mag Position, Hi/Lo Key, Fan Mode, Rec Review, Bars, Off	
Subdisplay brightness	4	1 to 4	
Self diagnostics (display only)	N/A	OK, Warning/error message	Displays self-diagnostics results. A message is displayed if an error occurs. *For details, see "Warning/Error Messages" (page 50).*

4-2 VF Menu List

This section describes the VF menu items displayed in the viewfinder or on a monitor.

Note

The items displayed in a web browser or on a tablet device are basically the same as the VF menu, with one exception. The item not displayed on these devices is noted in the following table.

The VF menu has the following structure.

Menu	Setting
Camera	Sets the camera's basic functions and image recording settings.
VF/SDI	Sets the monitor signal settings for output on the VF and SDI OUT connectors.
Display Info	Sets the display of status information and marker display in the viewfinder and on a monitor.
Config	Sets the ASSIGN buttons, warning voltage values, and cameras settings not related to output image signals.
File	Restores the menu settings to their factory default values.
Network	Sets wired/wireless LAN networks settings for connecting a camera. Not displayed in web browsers or on tablet devices.
Diagnosis	Displays self-diagnostics information.

4-2-1 Camera Menu

Page	Configuration item	Default	Settings	Remarks
<Base Setting> Basic settings	Color Space	S-Gamut	S-Gamut, F900	Selects the colors reproducibility. It is fixed to S-Gamut in F65RAW mode. S-Gamut: This mode enables recording with wide color space comparable to film cameras. F900: This mode enables color reproduction equivalent to conventional cameras.
	Gamma	S-Log2	S-Log1, S-Log2	Sets the tone curve (available in HD mode only). S-Log1: Gamma curve that can reproduce up to 1000% input light level. S-Log2: Gamma curve that can reproduce up to 1300% input light level.
	Color Temperature	5500K	3200K, 4300K, 5500K	3200K, 4300K: Tungsten 5500K: Daylight
	ND Filter	Clear	Clear, 0.9, 1.2, 1.5, 1.8, Close, Maintenance	Clear: No filter is used. 0.9: 1/8 optical transmittance 1.2: 1/16 optical transmittance 1.5: 1/32 optical transmittance 1.8: 1/64 optical transmittance Close: Filter closed (Display only) Maintenance: Maintenance mode, with no filter deployed.
	Exposure Index	800EI	200EI, 250EI, 320EI, 400EI, 500EI, 640EI, 800EI, 1000EI, 1250EI, 1600EI, 2000EI, 2500EI, 3200EI	Sets the sensitivity as an EI value.
	Highlight Latitude	6.0E	F65RAW mode/HD S-log2 mode: 4.0E, 4.4E, 4.7E, 5.0E, 5.4E, 5.7E, 6.0E, 6.4E, 6.7E, 7.0E, 7.4E, 7.7E, 8.0E HD S-log1 mode: 3.5E, 3.9E, 4.2E, 4.5E, 4.9E, 5.2E, 5.5E, 5.9E, 6.2E, 6.5E, 6.9E, 7.2E, 7.5E	Display only. Display changes in response to EI value. 200EI: 4.0E/3.5E 250EI: 4.4E/3.9E 320EI: 4.7E/4.2E 400EI: 5.0E/4.5E 500EI: 5.4E/4.9E 640EI: 5.7E/5.2E 800EI: 6.0E/5.5E 1000EI: 6.4E/5.9E 1250EI: 6.7E/6.2E 1600EI: 7.0E/6.5E 2000EI: 7.4E/6.9E 2500EI: 7.7E/7.2E 3200EI: 8.0E/7.5E
<System Format> Signal format settings	RAW/HD	F65RAW	F65RAW, HD	Sets the recording mode.
	Frame Rate	23.98p	F65RAW mode: 23.98p, 24p, 29.97p, 25p, 59.94p, S59.94p, S60p HD mode: 23.98p, 29.97p, 25p	Sets the frame rate.
	Signal Mode	4:4:4 RGB	4:4:4 RGB, 4:2:2 YCbCr	Selects the recording signal format in HD mode.
	Set	--	Execute by Enter.	

Page	Configuration item	Default	Settings	Remarks
<Shutter/FPS> Shutter settings	Shutter	Electronic	Electronic, M-Rotary, Off	When set to Electronic, the current shutter value is displayed in units of degrees.
	Degree	180.0	--	Displays the shutter angle (4.2 to 360.0). (Display only)
	Step	180.0	360.0, 270.0, 180.0, 172.8, 150.0, 144.0, 90.0, 45.0, 22.5, 11.2	Changes the shutter value in step mode. 360.0 and 270.0 are available for electronic shutter only.
	Continuous	180.0	4.2 to 360.0 (Electronic) 11.2 to 180.0 (M. Rotary)	Changes the shutter value in continuous variable mode.
	FPS	60 fps	1 to 60 (Electronic) 8 to 60 (M. Rotary)	Sets the number of frames shot per second when Select FPS format is selected.
<Shutter Assign> Shutter step settings	Step 1	360.0	4.2 to 360.0	Registers the shutter angles for each step.
	Step 2	270.0		
	Step 3	180.0		
	Step 4	172.8		
	Step 5	150.0		
	Step 6	144.0		
	Step 7	90.0		
	Step 8	45.0		
	Step 9	22.5		
	Step 10	11.2		
	Add	--	Execute by Enter.	Adds a shutter step value.
	Delete	--	Execute by Enter.	Deletes a shutter step value.
	Preset	--	Execute by Enter.	Restores the shutter step values to factory default values.
<Bars/Test Signal> Color bar and test signal settings	Color Bar	Off	On, Off	Turns the output of color bars On/Off.
	Test Signal	Off	Off, Saw, Step	Sets the test waveform output.

4-2-2 VF/SDI Menu

Page	Configuration item	Default	Settings	Remarks
<Signal Select> Output signal settings	Color	Color	Color, R, G, B	Selects the output RGB channels.
<Color Space> Color space settings	SDI Color Space	S-Gamut	S-Gamut, F900, ITU-R BT709	Selects the colors reproducibility for SDI output. S-Gamut: Wide color space comparable to film cameras. F900: Color space equivalent to conventional cameras. ITU-R BT709: Color space equivalent to ITU-R BT709.

Page	Configuration item	Default	Settings	Remarks
<LUT> Look-up table settings	LUT Select	On	On, Off	Sets whether to apply a LUT.
		709(800%)	709(800%), S-Log1, S-Log2	Selects the LUT (look-up table). 709(800%): Signal extending the dynamic range up to 800% based on ITU-R709. S-Log1: Non-adjustable signal for required post-production processing. Up to 1000% input light level can be reproduced. This option is available in HD mode when Gamma is set to S-Log1 on the <Base Setting> page. S-Log1: Non-adjustable signal for required post-production processing. Up to 1300% input light level can be reproduced. This option is available in F65RAW mode and HD mode when Gamma is set to S-Log2 on the <Base Setting> page.

4-2-3 Display Info Menu

Page	Configuration item	Default	Settings	Remarks
<Mix> Status, marker display settings	[Status/Menu] VF	On	On, Off	Displays the status/menu in the viewfinder.
	SDI	On	On, Off	Displays the status/menu on the monitor.
	[Marker] VF	On	On, Off	Displays markers in the viewfinder.
	SDI	On	On, Off	Displays markers on the monitor.
	Brightness	7	1 to 10	Adjusts the brightness of the marker display.
<Status1> Status indicator display item settings	FPS	Off	On, Off	Turns the frame rate display On/Off.
	ND Filter	Off	On, Off	Turns the ND filter display On/Off.
	Color Temperature	Off	On, Off	Turns the color temperature display On/Off.
	Exposure Index	Off	On, Off	Turns the EI value display On/Off.
	Electronic Shutter	Off	On, Off	Turns the shutter angle display On/Off for the electronic shutter.
	M.Rotary Shutter	Off	On, Off	Turns the shutter angle display On/Off for the mechanical rotary shutter.
	Media Remain	Off	On, Off	Turns the media remaining display On/Off.
<Status2> Status indicator display item settings	Battery DC IN 12V	Off	On, Off	Turns the 12 V supply voltage display On/Off.
	Battery DC IN 24V	Off	On, Off	Turns the 24V supply voltage display On/Off.
	Message	Off	On, Off	Turns the message display On/Off.
	LUT	On	On, Off	Turns the LUT file name display On/Off.
	Hi/Lo Key	On	On, Off	Sets whether to enable/disable the Hi/Lo Key function assigned to an assignable switch.
	Rec	On	On, Off	Turns the recording indicator On/Off.

Page	Configuration item	Default	Settings	Remarks
<Marker> Marker indicator display item settings	Center	Off	On, Off	Turns the center marker On/Off.
	Effective	Off	On, Off	Turns the effective pixel area marker display On/Off.
	Aspect Ratio	2.39:1	2.39:1, 2.35:1, 1.90:1, 1.85:1, 1.78:1, 1.66:1, 1.33:1, Variable	Sets the aspect ratio when Effective is set to On.
	Width	960	960 to 1920	Specifies the width of the effective pixel area when Aspect Ratio is set to Variable.
	Height	540	540 to 1080	Specifies the height of the effective pixel area when Aspect Ratio is set to Variable.
	Ratio (Variable)	1.78:1	n.mm:1	Displays “Width/Height:1” ratio when Aspect Ratio is set to Variable.

4-2-4 Config Menu

Page	Configuration item	Default	Settings	Remarks
<Switch Assign> ASSIGN button function assignment	Assign 1	Mag	Off, Mag, Mag Position, Hi/Lo Key, Fan Mode, Rec Review	Off: No function is allocated. Mag: Displays a magnified image in the viewfinder and on the SDI OUT connectors. Each time the button is pressed, the magnification changes between 2-times, 4-times, and Off. When the magnification is 2-times or 4-times, the ASSIGN button allocated with the Mag function is lit. Mag Position: Selects the position of the image that is magnified by the Mag function. Each time the button is pressed, the position moves from top left to bottom right. When the display is magnified, the ASSIGN button allocated with the Mag Position function is lit. Hi/Lo Key: Temporarily changes LUT for checking the high-luminance brightness and low-luminance darkness of the image in the viewfinder and from the SDI OUT connectors. The button toggles between high-luminance check (gain reduction), low-luminance check (gain amplification), and normal. Fan Mode: Switches the fan operating mode. For details on the fan operating mode, see *“3-3-9 Selecting the Fan Operating Mode” (page 29)*. Rec Review: Plays the video just recorded. Bars: Outputs color bars.
	Assign 2	Mag Position		
	Assign 3	Hi/Lo Key		
	Assign 4	Rec Review	Off, Mag, Mag Position, Hi/Lo Key, Fan Mode, Rec Review, Bars	

Page	Configuration item	Default	Settings	Remarks
<Fan Mode> Fan operating mode select	Fan Mode	Auto2	Auto1, Auto2, Min, Max	Auto1: Automatic control, according to the internal temperature. Auto2: Automatic control, according to the internal temperature, and maintains quiet operation when recording. Min: Quiet mode, without synchronization with recording (can be used at ambient temperatures of less than 30°C (86°F)). Max: High-speed mode, fan rotates at maximum speed.
<Date/Hour Meter> Date/Time settings and accumulated ON time display	Date	--	yyyy/mm/dd	Sets the current date.
	Time	--	hh:mm	Sets the current time.
	Hour Meter	--	0H to 99999H	Displays the accumulated powered-ON time since reset from the Service menu.
	Date Type	Y/Mn/D	Y/Mn/D, Mn/D	Selects the date display format.
<Sync> Sync signal status display	Genlock Status	--	Locked, Not Locked, No Signal	Display only. Locked: Synchronized successfully. Not Locked: Not synchronized. No Signal: There is no input signal.
<Battery Alarm> Supply voltage settings	DC IN (24V) Type	Type1	Type1, Type2	Selects the 24 V system supply settings.
	Near End	22.2 V	20.5 V to 30.0 V	Sets the power supply voltage drop warning level for the 24 V supply.
	End	21.6 V	20.0 V to 24.0 V	Sets the power supply exhausted warning level for the 24 V supply.
	DC IN (12V) Type	Type1	Type1, Type2	Selects the 12 V system supply settings.
	Near End	11.1 V	11.0 V to 17.0 V	Sets the power supply voltage drop warning level for the 12 V supply.
	End	10.8 V	10.5 V to 14.0 V	Sets the power supply exhausted warning level for the 12 V supply.

4-2-5 File Menu

Page	Configuration item	Default	Settings	Remarks
<All File> Configuration file import/export	Import	--	Execute by Enter.	Imports the settings of all menu parameters from a configuration file.
	Export	--	Execute by Enter.	Exports the settings of all menu parameters to a configuration file.
<File Preset> Restore settings to factory default	All File Preset	--	Execute by Enter.	Restores all settings to the factory default values.
<Media Format> Formatting media	MS/SD Format	--	Execute by Enter.	Initializes the media and creates folders for the F65.

4-2-6 Network Menu

This menu is not displayed in web browsers or on tablet devices.

Page	Configuration item	Default	Settings	Remarks
<LAN Setting> IP address settings	DHCP	Disabled	Enabled, Disabled	Sets whether to automatically obtain an IP address from a DHCP server.
	IP Address	192.168.1.1	0.0.0.0 to 255.255.255.255	If DHCP is enabled, displays the IP address obtained from the DHCP server.
	Subnet Mask	255.255.255.0	0.0.0.0 to 255.255.255.255	
	Default Gateway	0.0.0.0	0.0.0.0 to 255.255.255.255	
	Set	--	Execute by Enter.	
<Wi-Fi Setting> Wi-Fi settings	Wi-Fi	Disabled	Enabled, Disabled	Enables/disables the Wi-Fi settings. Enable for connection.
	Wi-Fi Status	No connectivity	Excellent, Good, Weak, No connectivity	Displays the communication/connection status.
	SSID	(Blank)	(Blank), String of up to 32 characters	Displays the network name.
	Network Type	--	Infra, ad-hoc	Displays the network connection mode.
	IP Address	--	0.0.0.0 to 255.255.255.255	Displays the value obtained from the DHCP server.
	Subnet Mask	--	0.0.0.0 to 255.255.255.255	
	Default Gateway	--	0.0.0.0 to 255.255.255.255	
	Scan Network	--	Execute by Enter.	Scans the network access point.
	Connect Manually	--	Execute by Enter.	Used to enter the network access point.
	ad-hoc Setting	--	Execute by Enter.	Configures ad-hoc network mode.
	SSID	(Blank)	(Blank), String of up to 32 characters	Sets the network name. Displayed only when Scan Network is executed.
	Network Type	Infra	Infra, ad-hoc	Displays the connection mode.
	Authentication	WPA2PSK	WPAPSK, WPA2PSK	Sets the network authentication method. Displayed only when Scan Network is executed.
	Encryption	AES	TKIP, AES	Sets the data encryption method. Displayed only when Scan Network is executed.
	WEP Key Index	1	1, 2, 3, 4	Selects the WEP key index number when using ad-hoc mode.
	Input Select	ASCII8-63	ASCII8-63, HEX64, ASCII5, ASCII13, HEX10, HEX26	Selects the network encryption key format. ASCII8-63: 63 characters in 8-bit ASCII format. HEX64: 64 digits in hexadecimal format. ASCII5: 5 characters in ASCII format. ASCII13: 13 characters in ASCII format. HEX10: 10 digits in hexadecimal format. HEX26: 26 digits in hexadecimal format. ASCII5, ASCII13, HEX10, and HEX26 are valid only in ad-hoc mode.
	Key	(Blank)	63-character ASCII or 64-digit hexadecimal	Sets the network encryption key.
	Set	--	Execute by Enter.	

Page	Configuration item	Default	Settings	Remarks
<Remote Setting> Remote control settings	Access Password	Disabled	Enabled, Disabled	Sets access permissions for remote control over a network.
		sonyf65	(Blank), String of up to 32 characters	Sets the password for access via a network.
<Network Reset> Network settings reset	Network Settings	--	Execute by Enter.	Resets the network settings.

4-2-7 Diagnosis Menu

Page	Configuration item	Default	Settings	Remarks
<Version> Version information display	System	--	V X.xx	Displays the version of the system, ICs, and software.
	DIF1 PLD	--	V X.xxy-yy	
	DIF1 CPU	--	V X.xxy-yy	
	DIF2 PLD	--	V X.xxy-yy	
	DIF2 CPU	--	V X.xxy-yy	
	DIF_CONF	--	V X.xxy-yy	
	VDA PLD	--	V X.xxy-yy	
	VDA_CONF	--	V X.xxy-yy	
	SY PLD	--	V X.xxy-yy	
	AT PLD	--	V X.xxy-yy	
	SY CPU	--	V X.xxy-yy	
	AT CPU	--	V X.xxy-yy	
	Update	--	Execute by Enter.	Updates the system. Consult your local Sony representative if you need to update the system.
<Maintenance> Maintenance tasks	Automatic Pixel Noise Reduction	--	--	Automatically compensates for the image sensor.
	Execute	--	Execute by Enter.	

Appendix

Metadata

The camera and lens metadata is output in auxiliary data packets on the main camera output and SDI OUT outputs, and is recorded on the SR-R4. The output metadata is in a format defined by the SMPTE RDD18 document.

The following metadata items are output.

Camera unit metadata set

Item name	Data type	Length (bytes)	Local tag	Meaning
Camera Unit Metadata	Set Key (UL)	16	–	Camera Unit Metadata Set Key. 06.0E.2B.34.02.53.01.01.0C.02.01.01.02.01.00.00
Length	BER Length	4	–	Metadata set length.
Exposure Index of Photo Meter	UInt16	2	81.15	Setting of the photo meter in ISO exposure index.
Neutral Density Filter Wheel Setting	UInt16	2	81.03	Transmittance of the built-in optical density (ND) filter.
Capture Frame Rate	Rational	8	81.06	Rate at which frames are captured in frames per second.
Image Sensor Readout Mode	UInt8	1	81.07	Image sensor readout mode.
Shutter Speed (Angle)	UInt32	4	81.08	Shutter speed as an angle (measured in minutes).
ISO Sensitivity	UInt16	2	81.0B	Sensitivity to light in ISO exposure index.
White Balance	UInt16	2	81.0E	White Balance value defined by the temperature in Kelvin.
Capture Gamma Equation	Label	16	32.10	Type of gamma curve applied to the main line video.
Camera Attributes	UTF8 String	Variable	81.14	Model name and serial number of the camera.

Sony F65 camera metadata set

Item name	Data type	Length (bytes)	Local tag	Meaning
User Defined Acquisition Metadata	Set Key (UL)	16	–	User Defined Acquisition Metadata Set Key. 06.0E.2B.34.02.53.01.01. 0C.02.01.01.7F.01.00.00
Length	BER Length	4	–	Sony F65 camera metadata set length.

Item name	Data type	Length (bytes)	Local tag	Meaning
UDAM Set Identifier	AUID	16	E0.00	Sony F65 metadata set identifier. 20500000-f0c0-1181-9669-08004678031c
Effective Marker Coverage	Rational	8	E1.01	Shrink ratio of the effective frame to the payload picture frame expressed as pixels along the short edges. For example, the coverage value for 90% area of 4096 × 2160 is expressed as 1944/2160.
Effective Marker Aspect Ratio	Rational	8	E1.02	Aspect ratio of the effective frame. For example, the aspect ratio for 90% area of 4096 × 2160 is expressed as 3686/1944.
Camera Process Discrimination Code	Uint16	2	E1.03	For F65 internal use only (F65RAW mode output only).
Rotary Shutter Mode	Boolean	1	E1.04	Mechanical rotary shutter mode. TRUE: Mechanical rotary shutter is in use. FALSE: Electronic shutter only is in use or shutter is off.
Raw Black Code Value	Uint16	2	E1.05	Code value of reference black level (shielded sensor) (F65RAW mode output only).
Raw Gray Code Value	Uint16	2	E1.06	Code value of light from 18% reflectance chart at suitable exposure (F65RAW mode output only).
Raw White Code Value	Uint16	2	E1.07	Code value of light from 90% reflectance chart at suitable exposure (F65RAW mode output only).
Monitoring Characteristics	AUID	16	E1.08	16-byte UID indicating the monitoring characteristics. On the F65, contains the LUT gamma label.

Warning/Error Messages

If the battery voltage drops or an error is detected when power is applied or during operation, the corresponding indicator lights up/flashes and a message appears on the subdisplay. The error details are displayed in the self-diagnostics on settings page 3 on the subdisplay and in the viewfinder.
Warnings and error messages occurring on the SR-R4 are also displayed in the self-diagnostics field.

For details about SR-R4 messages, refer to the operation manual of the SR-R4.

A message prompt is also displayed in the viewfinder/ monitor to execute the APR function if a defect is detected in the image sensor when the camera powers on or if the APR function is not executed regularly. If prompted, execute Automatic Pixel Noise Reduction on the <Maintenance> page of the Diagnosis menu.

Indicator	Subdisplay	Self diagnostics field indication	Meaning
REC: Flashing red	12 V power supply voltage indicator flashing	12V Battery (Near End)	The voltage of the 12 V power supply has fallen to the Near End value setting.
REC: Flashing red rapidly	12 V power supply voltage indicator flashing rapidly	12V Battery (End)	The voltage of the 12 V power supply has fallen to the End value setting.
REC: Flashing red	24 V power supply voltage indicator flashing	24V Battery (Near End)	The voltage of the 24 V power supply has fallen to the Near End value setting.
REC: Flashing red rapidly	24 V power supply voltage indicator flashing rapidly	24V Battery (End)	The voltage of the 24 V power supply has fallen to the End value setting.
REC: Flashing when synced with SR-R4.	Media remaining indicator flashing	Media Remain (Near End)	The remaining media on the SR-R4 has reduced to the Near End value setting.
REC: Flashing when synced with SR-R4.	Media remaining indicator flashing rapidly	Media Remain (End)	The remaining media on the SR-R4 has reduced to the End value setting.
DIAGNOSIS: Flashing red rapidly	Displays same message as self diagnostics field in a dialog.	Temperature NG! Shutdown Camera	The internal camera temperature has reached its limit. Turn off the camera power supply. *Consult your local Sony representative.*
DIAGNOSIS: Flashing red rapidly	Fan1 NG!	Fan1 NG!	Fan 1 near the top panel stopped. *Consult your local Sony representative.*
DIAGNOSIS: Flashing red rapidly	Fan2 NG!	Fan2 NG!	Fan 2 near the top panel stopped. *Consult your local Sony representative.*
DIAGNOSIS: Flashing red	Sync Error	Sync Error	A sync error occurred. *If the error continues, consult your local Sony representative.*
DIAGNOSIS: Lit red DOCK: Lit yellow	Optical Level Care	Optical Level Care	The optical level of the Recorder connector has reduced to caution level. Clean the Recorder connector or replace the optical module.
DIAGNOSIS: Lit red DOCK: Lit red	Optical Level NG	Optical Level NG	A light reception error occurred with the Recorder connector. Immediately, clean the Recorder connector or replace the optical module.
DIAGNOSIS: Lit red DOCK: Not lit	Optical Level No Input	Optical Level No Input	No signal is input on the Recorder connector.
DIAGNOSIS: Lit red	CRCC Error occurred	CRCC Error occurred	A Cyclic Redundancy Check Code (CRCC) error occurred with the Recorder connector. Clean the recorder connector. *If the error continues, even after cleaning, consult your local Sony representative.*

Indicator	Subdisplay	Self diagnostics field indication	Meaning
–	Unsupported device	Unsupported device	Unsupported USB device is connected to the USB connector.
–	Hubs not supported	Hubs not supported	The camera does not support USB hubs.

Precautions

Use and storage

Do not subject the unit to severe shocks

The internal mechanism may be damaged or the body warped.

Do not block the ventilation holes

If the ventilation holes are blocked, not only are the characteristics not guaranteed, but also extreme degradation of the internal parts will likely result, causing defects of the camera.

For the locations of the ventilation holes, see the figures in "1-3 Locations and Functions of Parts" (page 11).

After use

Always turn off the power.

Use and storage locations

Store in a level, ventilated place. Avoid using or storing the unit in the following places:

- Places subject to temperature extremes
- Very damp places
- Places subject to severe vibration
- Near strong magnetic fields
- In direct sunlight or close to heaters for extended periods

To prevent electromagnetic interference from portable communications devices

The use of portable telephones and other communications devices near this unit can result in malfunctions and interference with audio and video signals.
It is recommended that the portable communications devices near this unit be powered off.

Note on laser beams

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

Condensation

If you move the camera from a very cold place to a warm place, or use it in a damp location, condensation may form on the lens or inside the camera.
The camera has no built-in condensation indicator. If you find condensation on the body or lens, switch the camera off and wait for the condensation to disappear for about one hour.

Image sensor phenomena

The following phenomena that may appear in images are specific to image sensors. They do not indicate malfunctions.

White flecks

Although the image sensors are produced with high-precision technologies, fine white flecks may be generated on the screen in rare cases, caused by cosmic rays.
This is related to the principle of image sensors and is not a malfunction.

The white flecks especially tend to be seen

- when operating at a high environmental temperature

Aliasing

When fine patterns, stripes, or lines are shot, they may appear jagged or flicker.

To forcibly open the shutter

Should the shutter to control incoming light to the image sensor not open, immediately consult your local Sony representative.
If you want to continue shooting urgently, you can use the shutter emergency open screw *(page 11)* to forcibly open the shutter to a position that ensures an optical light path.

For information about using the shutter emergency open screw, consult your local Sony representative.

When setting the video format

It is recommended that the power be turned off and back on again after changing the video format.

Cleaning the Recorder Connector

Note

Before cleaning the recorder connector, always check that the power supply is disconnected before proceeding.

If the recorder connector is dirty, there is increased risk of errors in the data transmission between the camera and the SR-R4. The recorder connector should be cleaned if any of the following conditions occurs.

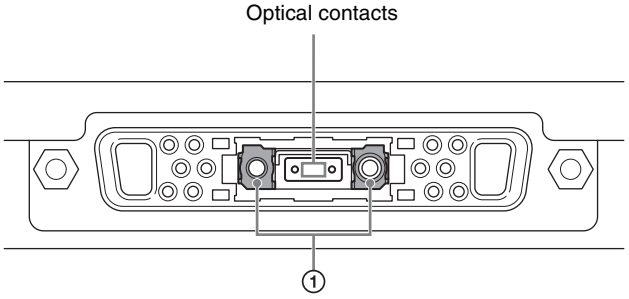
- DOCK indicator is lit yellow or red.
- DIAGNOSIS indicator is lit red and the "CRCC Error occurred" message is displayed.

You will need the following items in order to clean the recorder connector:

- Commercially available optical fiber cleaning swabs
- 99.5% (or higher) pure alcohol

1 Remove the SR-R4. If the SR-R4 was not connected, remove the connector cap from the recorder connector.

2 Press the recorder connector using your finger ①, and open the protective shutter to expose the optical contacts.



3 Dip an optical fiber cleaning swab in alcohol and gently wipe the whole optical contacts area about five times.

Notes

- Always use alcohol only in well-ventilated areas away from heat or flame.
- Wiping firmly may damage the optical fiber contacts.

4 Release the connector's protective shutter, and connect the SR-R4. If not connecting the SR-R4, reattach the connector cap.

About "Memory Stick Duo"

Supported types of "Memory Stick"

You can use "Memory Stick Duo" or "Memory Stick PRO Duo."
The camera operations have been checked using "Memory Stick" media up to 32 GB.
This camera is not compliant with high-speed data transfer with this type of "Memory Stick."

Operations checked with:

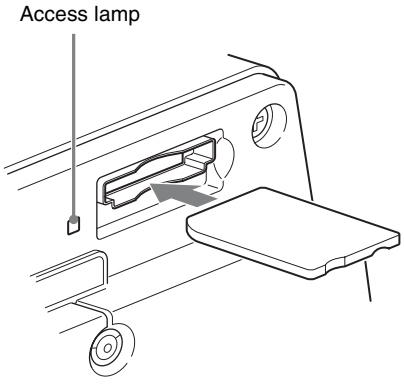
MSX-M2GN
MSX-M1GST
MSX-M2GST
MS-HX8
MS-HX32
MS-MT2G
MS-MT4G
MS-MT16G
MS-MT32G

Note on data read/write speed

Data read/write speed may vary depending on the combination of the "Memory Stick" and "Memory Stick" compliant product you use.

Inserting a "Memory Stick Duo"

Insert a "Memory Stick Duo" with the label side facing left into the "Memory Stick Duo" slot until it clicks and the access lamp lights in red. Check that the access lamp then goes off.



Note

If it does not fit into the slot properly or if there is some resistance when you insert it, the "Memory Stick Duo" may be turned around or upside-down. Do not force the "Memory Stick Duo" into the slot. Confirm the direction of the notch and arrow on the "Memory Stick Duo" before

inserting the “Memory Stick Duo,” and then try inserting it again.

To remove a “Memory Stick Duo”

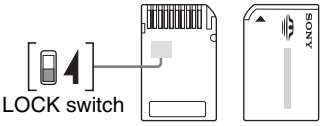
Confirm that the access lamp is not flashing red, then lightly push in the “Memory Stick Duo” to release the lock.

Note

If the access lamp is flashing red, data is being read from or written to the “Memory Stick Duo” At this time, do not shake the product or subject it to shock. Do not turn off the power to the product or remove the “Memory Stick Duo.” Doing so may damage the data.

Protecting saved data

To prevent accidental erasure of important setup data, use the LOCK switch on the “Memory Stick Duo.”
Slide the switch upward to the write protect position. This ensures that you cannot inadvertently overwrite data on the “Memory Stick Duo.”



Note

The “Memory Stick Duo” does not have a LOCK switch. When using “Memory Stick Duo” media, be careful not to inadvertently overwrite or erase your data.

Precautions

- Do not attach anything other than the supplied label to the “Memory Stick Duo” labeling position.
- Attach the label so that it does not stick out beyond the labeling position.
- Carry and store the “Memory Stick Duo” in its case.
- Do not touch the connector of the “Memory Stick Duo” with anything, including your finger or metallic objects.
- Do not strike, bend, or drop the “Memory Stick Duo.”
- Do not disassemble or modify the “Memory Stick Duo.”
- Do not allow the “Memory Stick Duo” to get wet.
- Do not use or store the “Memory Stick Duo” in a location that is:
  —Extremely hot, such as in a car parked in the sun
  —Under direct sunlight
  —Very humid or subject to corrosive substances
- To prevent data loss, make backups of data frequently. In no event will Sony be liable for any loss of data.
- Unauthorized recording may be contrary to the provisions of copyright law. When you use a “Memory Stick Duo” that has been pre-recorded, be sure that the material has been recorded in accordance with copyright and other applicable laws.

Specifications

General

Power requirements
10.5 V to 17 V DC
Power consumption
Approx. 65 W with 23.98 PsF (Mechanical rotary shutter operating. not including lens, viewfinder)
Operating temperature
0 °C to 40 °C (32 °F to 104 °F)
Storage temperature
–20 °C to +60 °C (–4 °F to +140 °F)

Imagers

Imagers	Super 35-mm CMOS image sensor
Method	Single sensor
Aspect ratio	17:9

Electrical characteristics

Latitude	14-stop
Registration	Within 0.02% (not including lens distortion)
Geometric distortion	Negligible (not including lens distortion)

Optical system specifications

Lens mount	PL Mount
Flange focal length	52.00 mm (–0.03 mm to +0.05 mm adjustable in 0.01 mm increments by shim replacement)

Input/output connectors

DC IN	LEMO 8-pin male (1), 10.5 V to 17 V DC, 24 V DC
DC OUT	12 V: 11-pin (1), 12 V DC, 4 A maximum 24 V: 3-pin (1), 24 V DC, 4 A maximum (The usable current may be limited depending on the load and input conditions.)
VF	20-pin (1)
LENS	12-pin (1)
SDI OUT	4:2:2, BNC type (2), HD-SDI signal, BTA-S004A-compliant, 75 ohms, 0.8 Vp-p, 1.485 Gbps
HD-Y OUT	BNC type (1), 75 ohms, 1.0 Vp-p
GENLOCK IN	BNC type (1), 75 ohms, SMPTE 274M HD 3-level sync, 0.6 Vp-p
REMOTE	8-pin (1)
EXT I/O	LEMO 5-pin, female (1)
(network)	RJ-45 type (1), 10BASE-T, 100BASE-TX
Lens mount hot shoe	4-pin (2), conforming to ARRI LDS (Lens Data System) and Cooke /i Intelligent Electronic Lens System
USB	Type A, USB2.0 Hi-Speed (2)
“Memory Stick” (MS)/SD memory card	Combo-connector (1) Supports “Memory Stick Duo”, “Memory Stick PRO Duo” Supports SD memory cards, SDHC memory cards up to class 10

Supplied accessories

+B3 × 5 screws (4)
Cable clamp belt (1)
Belt bracket (1)
Power cable connector (LEMO 8-pin) (1)
Operation guide (1)
Operation manual (CD-ROM) (1)

Optional accessories

Portable Memory Recorder SR-R4
HD Electronic Viewfinder
HDVF-C30WR (2.7-inch type, color)
Wi-Fi Adapter CBK-WA01
“Memory Stick Duo”

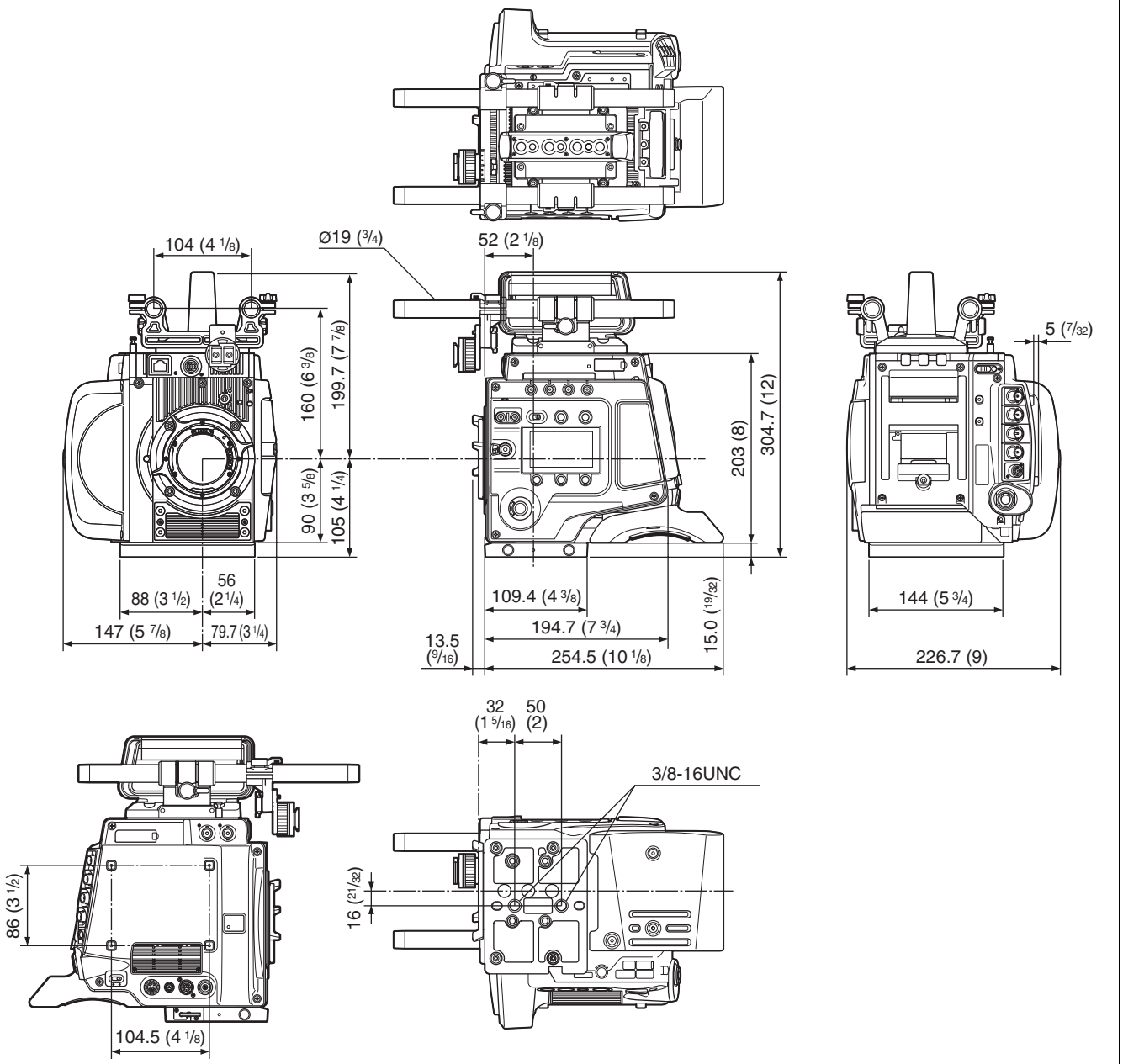
Design and specifications are subject to change without notice.

Note

Always verify that the unit is operating properly before use. SONY WILL NOT BE LIABLE FOR DAMAGES OF ANY KIND INCLUDING, BUT NOT LIMITED TO, COMPENSATION OR REIMBURSEMENT ON ACCOUNT OF THE LOSS OF PRESENT OR PROSPECTIVE PROFITS DUE TO FAILURE OF THIS UNIT, EITHER DURING THE WARRANTY PERIOD OR AFTER EXPIRATION OF THE WARRANTY, OR FOR ANY OTHER REASON WHATSOEVER.

Dimensions

Unit: mm (inches)



Weight: Camera head 5 kg (11 lb)
With accessories 6.5 kg (14 lb 5 oz)

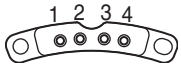
Connector Pin Assignments

REMOTE (8-pin female)

(External View)

No.	Signal	I/O	Specifications
1	TX (+)	OUT	SERIAL Data out
2	TX (–)	OUT	
3	RX (+)	IN	SERIAL Data in
4	RX (–)	IN	
5	TX-GND	—	GND for TX
6	UNREG	OUT	+10.5 to +17 V dc, 200mA (max)
7	UNREG-GND	—	GND for UNREG
8	VIDEO	OUT	75Ω, 1.0 Vp-p
	CHASSIS GND	—	CHASSIS GND

Lens-mount hot shue (4-pin)



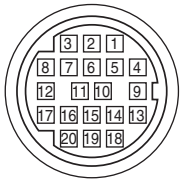
No.	Signal	I/O	Specifications
1	RX	IN	SERIAL DATA in
2	TX	OUT	SERIAL DATA out
3	GND		GND for +24 V
4	+24 V	OUT	+24 V, 200 mA (MAX)

LENS (12-pin female)

(External View)

No.	Signal	I/O	Specifications
1	RET VIDEO ENABLE	IN	ENABLE: 0 V DISABLE: +5 V or OPEN
2	VTR START/ STOP	IN	ENABLE: 0 V DISABLE: +5 V or OPEN
3	GND	—	GND for UNREG
4	—	—	Not used
5	IRIS CONT	OUT	+3.4 V (F16) to +6.2 V (F2.8)
6	UNREG	OUT	+10.5 V to +17 V 500 mA (MAX)
7	IRIS POSITION	IN	+3.4 V (F16) to +6.2 V (F2.8)
8	—	—	Not used
9	—	—	Not used
10	—	—	Not used
11	NC		No connection
12	NC		No connection

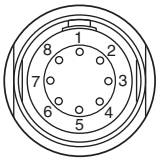
VF (20-pin female)



(External View)

No.	Signal	I/O	Specifications
1	S-DATA	IN/OUT	TTL level
2	NC		No connection
3	NC		No connection
4	SCK	OUT	TTL level
5	NC		No connection
6	NC		No connection
7	NC		No connection
8	G TALLY	OUT	ON: 5 V OFF: GND
9	NC		No connection
10	NC		No connection
11	NC		No connection
12	Y VIDEO	OUT	1.0 Vp-p, Zo=75Ω
13	VIDEO GND	—	GND for VIDEO
14	Pb VIDEO	OUT	±0.35 Vp-p, Zo=75Ω
15	Pr VIDEO	OUT	±0.35 Vp-p, Zo=75Ω
16	NC		No connection
17	R TALLY	OUT	ON: 5 V OFF: GND
18	NC		No connection
19	UNREG GND	—	GND for UNREG
20	UNREG	OUT	+10.5 V to +17 V

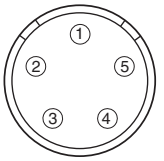
DC IN (8-pin male)



(External View)

No.	Signal	I/O	Specifications
1	UNREG_GND	—	GND for +12 V
2	UNREG_GND	—	GND for +12 V
3	UNREG_GND (24 V)	—	GND for +24 V
4	UNREG_24 V_IN	IN	+24 V
5	UNREG_12 V_IN	IN	+12 V
6	UNREG_12 V_IN	IN	+12 V
7	UNREG_12 V_IN	IN	+12 V
8	UNREG_GND	—	GND for +12 V

EXT I/O (5-pin female)

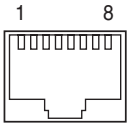


(External View)

No.	Signal	I/O	Specifications
1	EXT_CMD1_OUT	OUT	RS-232C
2	EXT_CMD0_OUT	OUT	
3	EXT_CMD1_IN	IN	
4	EXT_CMD0_IN	IN	
5	GND	—	

(Modular jack)

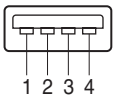
Conforming to IEEE 802.3u (100BASE-TX), IEEE802.3 (10BASE-T)



(External View)

No.	Signal	I/O	Specifications
1	TXD (+)	OUT	
2	TXD (–)	OUT	
3	RXD (+)	IN	
4	NC	—	
5	NC	—	
6	RXD (–)	IN	
7	NC	—	
8	NC	—	

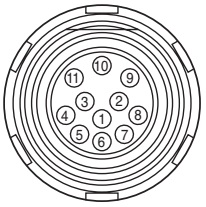
USB



(External View)

No.	Signal	I/O	Specifications
1	VBUS	OUT	5 V dc, 500 mA (max)
2	D-	IN/OUT	
3	D+	IN/OUT	
4	GND	—	

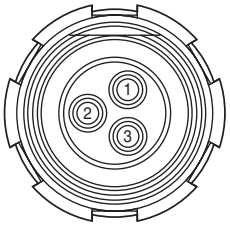
DC OUT 12 V (11-pin female)



(External View)

No.	Signal	I/O	Specifications
1	NC		
2	NC		
3	NC		
4	NC		
5	NC		
6	NC		
7	NC		
8	NC		
9	UNREG_GND	—	
10	NC		
11	UNREG_12 V_OUT	OUT	+12 V DC 4 A (MAX)

DC OUT 24 V (3-pin female)



(External View)

No.	Signal	I/O	Specifications
1	UNREG_GND (24 V)	—	
2	UNREG_24 V_OUT	OUT	+24 V DC 4 A (MAX)
3	REC trigger	IN	OPEN or +5 V: Normal GND: Active

Menu Operation using a Web Browser

The settings menus of this camera can be controlled from a computer using a Web browser.

Supported OS

Windows XP, Windows Vista, Windows 7
Mac OS X

Supported browsers

Firefox 8 or Later
Google Chrome 13 or Later

To display the menu

1 Set the IP address in the IP Address field on the <IP Address Setting> page in the Network menu.

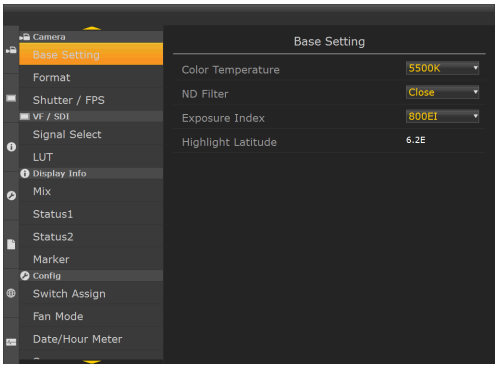
Example: 192.168.1.2

2 Connect a computer to the camera via a hub or directly using a cross cable.

3 Launch the web browser on the computer and enter http:// then the IP address you set on the <IP Address Setting> page.

Example: http://192.168.1.2

The following menu screen appears.



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Operation using a Tablet Device

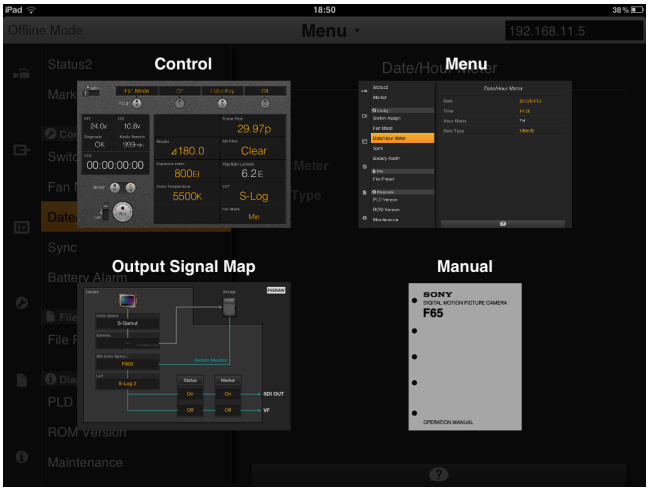
The camera can be operated wirelessly by installing the "F65Remote" application for tablet devices.
A CBK-WA01 Wi-Fi adapter (option) is required for wireless operation.

For details about mounting the CBK-WA01, see "2-5 Mounting the CBK-WA01" (page 20).

Operations using F65Remote

- Display and set frequently used menu settings in a list (Control screen)
- Display menu setting status from video signal input to output (Output Signal Map screen)
- Display and change camera configuration settings (Menu screen)*
- Display Operation Manual using iBooks (Manual screen)

* Some menus cannot be displayed.



Supported devices

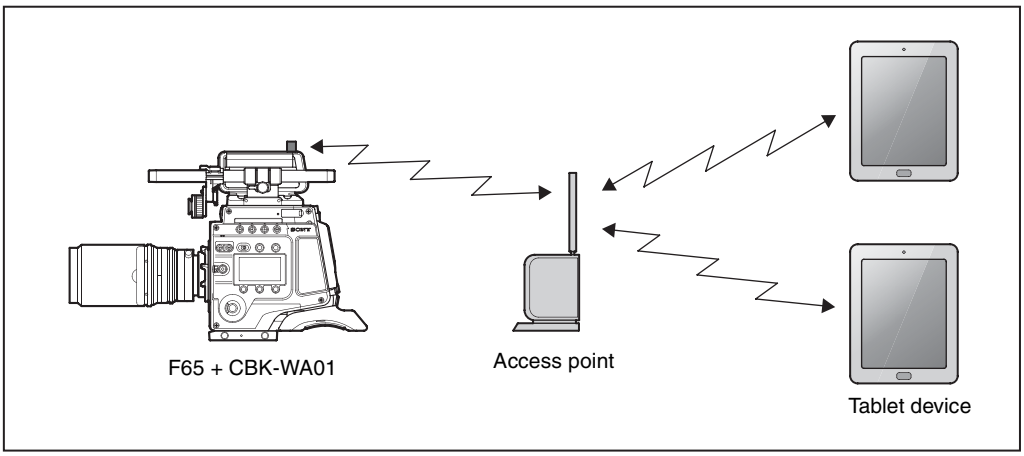
iPad, iPad2	iOS 5.0 or later
Android devices [1)]	Android 3.2

1) Operation tested on Sony tablet devices only.

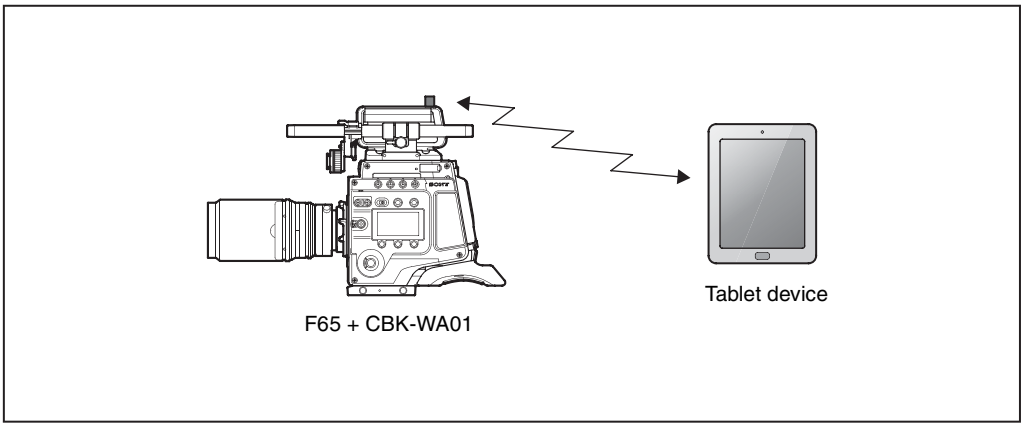
Camera and Tablet Device Connections

There are two modes supported for connecting devices.

Infrastructure mode



Ad-hoc mode



Infrastructure mode

Uses a Wi-Fi connection between the camera and table device via a wireless LAN access point.
In this mode, multiple devices can communicate with the camera wirelessly via the access point. Use this mode if you plan to connect with and control a camera from more than one tablet device.

Ad-hoc mode

Uses a direct Wi-Fi connection between the camera and table device.
In this mode, an access point is not required, and only a single device can communicate with the camera wirelessly. Use this mode if an access point cannot be set up due to difficulty guaranteeing the power supply or other reasons.

For details about the connection method, refer to the help for the tablet device.

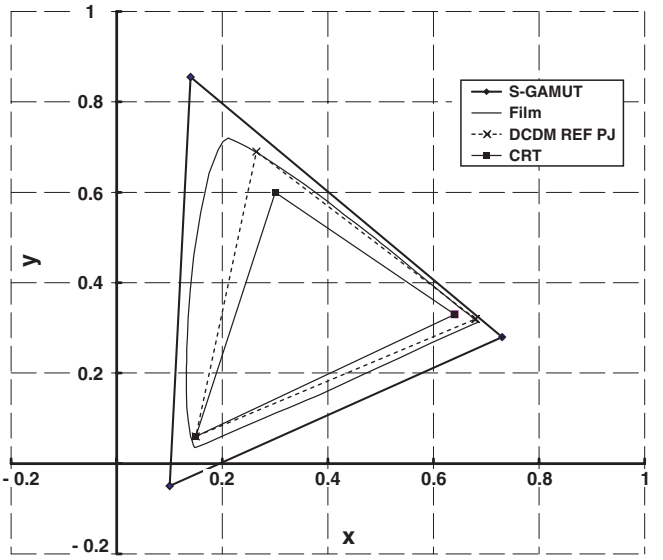
Notes

- Connection using IEEE802.11n is not supported in ad-hoc mode. Data encryption method uses WEP only.
- Some tablet devices are not equipped with the necessary hardware for ad-hoc mode. For details, refer to the operating instructions for your tablet device.
- While multiple tablet devices can connect to the camera in infrastructure mode, only the device that is “Active” may modify the camera settings. Other connected devices may only monitor the settings.
- If the camera is connected using a network cable and the IP address settings on the <LAN Setting> page and the <Wi-Fi Setting> page in the Network menu are the same, then Wi-Fi is disabled. To use LAN and Wi-Fi simultaneously, set different values for the IP address settings on the <LAN Setting> page and the <Wi-Fi Setting> page. If the camera is not connected using a network cable, then Wi-Fi is enabled, even if the same IP address is set on both pages.

Color Space According to the COLOR SPACE Settings

The color space of the camera main signal, recorded by the SR-R4 when connected, is S-GAMUT mode. The color space of the output signal for the viewfinder and SDI OUT connectors is converted to ITU-R BT.709 color space.

Colorimetry



1. Virtual chromaticity points at S-GAMUT

The virtual color space at S-GAMUT is shown in the above chart. The virtual chromaticity points are as follows:

	x	y
R	0.73	0.28
G	0.14	0.855
B	0.1	–0.05

When converting the color space of a video source shot with this camera in S-GAMUT mode, use these virtual chromaticity points.
These chromaticity points are “virtual” because they do not represent the actual, accurate color space but are the calculated values for calculation of color space conversion. These virtual chromaticity points have been introduced because the actual color space cannot be represented as a triangle in this colorimetry.
The following equation provides a simple conversion from the color space for S-GAMUT to that for conventional cameras (HDC-F950, HDW-F900R, etc.):

$$\begin{bmatrix} R \\ G \\ B \end{bmatrix} = \begin{bmatrix} 1.306240 & -0.233075 & -0.073165 \\ -0.126851 & 1.178376 & -0.051526 \\ 0.000120 & -0.085649 & 1.085529 \end{bmatrix} \begin{bmatrix} R_w \\ G_w \\ B_w \end{bmatrix}$$

(Rw, Gw, Bw): RGB values for the original color space for S-GAMUT
(R, G, B): Values after being converted to the color space for conventional cameras

Use the following equations to convert from S-GAMUT to another color gamut.

Converting to ITU-R.BT709/sRGB

$$\begin{bmatrix} R \\ G \\ B \end{bmatrix} = \begin{bmatrix} 1.8779151284 & -0.7941687613 & -0.0837463671 \\ -0.1768069813 & 1.3509996209 & -0.1741926396 \\ -0.0262011264 & -0.1484222623 & 1.1746233888 \end{bmatrix} \begin{bmatrix} R_w \\ G_w \\ B_w \end{bmatrix}$$

(Rw, Gw, Bw): RGB values for the original color space for S-GAMUT
(R, G, B): RGB values after conversion

Converting to ACES-GAMUT (American Color Encoding Space)

- **Daylight: 5500K**

$$\begin{bmatrix} R \\ G \\ B \end{bmatrix} = \begin{bmatrix} 0.8764457030 & 0.0145411681 & 0.1090131290 \\ 0.0774075345 & 0.9529571767 & -0.0303647111 \\ 0.0573564351 & -0.1151066335 & 1.0577501984 \end{bmatrix} \begin{bmatrix} R_w \\ G_w \\ B_w \end{bmatrix}$$

- **Tungsten: 3200K or 4300K**

$$\begin{bmatrix} R \\ G \\ B \end{bmatrix} = \begin{bmatrix} 1.0110238740 & -0.1362526051 & 0.1252287310 \\ 0.1011994504 & 0.9562196265 & -0.0574190769 \\ 0.0600766530 & -0.1010185315 & 1.0409418785 \end{bmatrix} \begin{bmatrix} R_w \\ G_w \\ B_w \end{bmatrix}$$

(Rw, Gw, Bw): RGB values for the original color space for S-GAMUT
(R, G, B): RGB values after conversion

Use the following equation to express the S-GAMUT as an XYZ color space.

$$\begin{bmatrix} X \\ Y \\ Z \end{bmatrix} = \begin{bmatrix} 0.7064827132 & 0.1288010498 & 0.1151721641 \\ 0.2709796708 & 0.7866064112 & -0.0575860820 \\ -0.0096778454 & 0.0046000375 & 1.0941355587 \end{bmatrix} \begin{bmatrix} R_w \\ G_w \\ B_w \end{bmatrix}$$

(Rw, Gw, Bw): RGB values for the original color space for S-GAMUT
(X, Y, Z): Values after conversion to XYZ color space

2. Color space for film

The color space for film shown in the above chart represents measurements from VISION Premier Film EK 2393.

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directfb
e2fsprogs
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gawk
gdisk
gpm
iputils
libtool
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memstat
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ncurses
nfs-utils
procinfo
pump
time
util-linux-ng
vsftpd
wireless-tools
acl
glibc
bash
busybox
coreutils
diffutils
dosfstools
ethtool
findutils
fuse
glib
grep
ksymoops
less
liboil
libusb
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oprofile
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setserial
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@version 3.0 (December 2000)

Optimised ANSI C code for the Rijndael cipher (now AES)

@author Vincent Rijmen <vincent.rijmen@esat.kuleuven.ac.be>
@author Antoon Bosselaers <antoon.bosselaers@esat.kuleuven.ac.be>
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