

# 4K3D Video Recorder

## Instructions for Use

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

HVO-4000MT

**HDMI**  

## Owner's Record

The model and serial numbers are located at the rear. Record these numbers in the space provided below. Refer to these numbers whenever you call upon your Sony dealer regarding this product.

Model No.  
Serial No.

## Indications for Use/Intended Use

The Sony HVO-4000MT 4K, 3D and 2D Video Recorder is intended to record 4K video and still images from endoscopic/laparoscopic camera systems, surgical microscope and other compatible medical imaging systems. This medical grade recorder can save video and still images to an internal hard disk drive, a portable USB drive, optical disk or to a compatible network server. The recorded images can be used for the patient record, training or education. The recorder is suitable for use in hospital operating rooms, medical imaging centers, surgical centers, clinics, doctor's offices and similar healthcare environments.

### 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.**

**No modification of this equipment is allowed.**

### WARNING

**To avoid the risk of electric shock, this equipment must only be connected to a supply mains with protective earth.**

### WARNING

To disconnect the main power, unplug the power plug. When installing the unit, incorporate a readily accessible disconnect device in the fixed wiring, or connect the power plug to an easily accessible socket-outlet near the unit.

Do not position the ME equipment where it is difficult to unplug the power plug.

If a fault should occur during operation of the unit, operate the disconnect device to switch the power supply off, or unplug the power plug.

### CAUTION

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

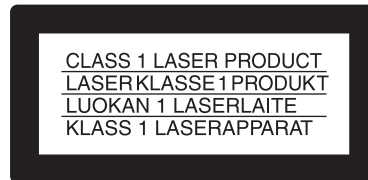
When you dispose of the battery, you must obey the law in the relative area or country.

## WARNING

If you don't use the remote for an extended period of time, remove the batteries to avoid possible damage from battery leakage and corrosion.

### Caution

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.



This HVO-4000MT is classified as a CLASS 1 LASER PRODUCT. (IEC 60825-1: 2007)

### Caution

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

### CAUTION

The apparatus shall not be exposed to dripping or splashing. No objects filled with liquids, such as vases, shall be placed on the apparatus.

### Symbols on the products



#### Consult the Instructions for Use

Follow the directions in the Instructions for Use for parts of the unit on which this mark appears.



This symbol indicates the manufacturer, and appears next to the manufacturer's name and address.



This symbol indicates the European Community representative, and appears next to the European Community representative's name and address.



This symbol indicates the equipotential terminal which brings the various parts of a system to the same potential.

## 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.

### Caution

Federal law (United States of America) restricts this device to sale by or on the order of a licensed healthcare practitioner.

**Rx**  
ONLY

## For the customers in Canada

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

This unit has been certified according to Standard CAN/CSA-C22.2 No.60601-1.

### Important safeguards/notices for use in the medical environments

- 1 All the equipments connected to this unit shall be certified according to Standard IEC60601-1, IEC60950-1, IEC60065 or other IEC/ISO Standards applicable to the equipments.
- 2 Furthermore all configurations shall comply with the system standard IEC60601-1. Everybody who connects additional equipment to the signal input part or signal output part configures a medical system, and is therefore, responsible that the system complies with the requirements of the system standard IEC60601-1. If in doubt, consult the qualified service personnel.
- 3 The leakage current could increase when connected to other equipment.

- 4 For this particular equipment, all accessory equipment connected as noted above, must be connected to mains via an additional isolation transformer conforming with the construction requirements of IEC60601-1 and providing at least Basic Insulation.
- 5 This equipment generates, uses, and can radiate radio frequency energy. If it is not installed and used in accordance with the instruction manual, it may cause interference to other equipment. If this unit causes interference (which can be determined by unplugging the power cord from the unit), try these measures: Relocate the unit with respect to the susceptible equipment. Plug this unit and the susceptible equipment into different branch circuit.

Consult your dealer. (According to standard IEC60601-1-2 and CISPR11, Class B, Group 1)

## Important EMC notices for use in the medical environments

- The HVO-4000MT needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information provided in the instructions for use.
- The portable and mobile RF communications equipment such as cellular phones can affect the HVO-4000MT.

### Warning

The use of accessories and cables other than those specified, with the exception of replacement parts sold by Sony Corporation, may result in increased emissions or decreased immunity of the HVO-4000MT.

Guidance and manufacturer’s declaration-electromagnetic emissions		
The HVO-4000MT is intended for use in the electromagnetic environment specified below. The customer or the user of the HVO-4000MT should assure that it is used in such an environment.		
Emission test	Compliance	Electromagnetic environment-guidance
RF emissions CISPR 11	Group 1	The HVO-4000MT uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.  The HVO-4000MT is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
RF emissions CISPR 11	Class B	
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/flicker emissions IEC 61000-3-3	Complies	

### Warning

If the HVO-4000MT should be used adjacent to or stacked with other equipment, it should be observed to verify normal operation in the configuration in which it will be used.

**Guidance and manufacturer's declaration - electromagnetic immunity**


The HVO-4000MT is intended for use in the electromagnetic environment specified below. The customer or the user of the HVO-4000MT should assure that it is used in such as environment.

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment-guidance
Electrostatic discharge (ESD) IEC 61000-4-2	±6 kV contact ±8 kV air	±6 kV contact ±8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/output lines	±2 kV for power supply lines ±1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV line(s) to line(s) ±2 kV line(s) to earth	±1 kV differential mode ±2 kV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	< 5% $U_T$ (> 95% dip in $U_T$ ) for 0.5 cycle  40% $U_T$ (60% dip in $U_T$ ) for 5 cycles  70% $U_T$ (30% dip in $U_T$ ) for 25 cycles  < 5% $U_T$ (> 95% dip in $U_T$ ) for 5 sec	< 5% $U_T$ (> 95% dip in $U_T$ ) for 0.5 cycle  40% $U_T$ (60% dip in $U_T$ ) for 5 cycles  70% $U_T$ (30% dip in $U_T$ ) for 25 cycles  < 5% $U_T$ (> 95% dip in $U_T$ ) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment. If the user of the HVO-4000MT requires continued operation during power mains interruptions, it is recommended that the HVO-4000MT be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.

NOTE:  $U_T$  is the a.c. mains voltage prior to application of the test level.

### Guidance and manufacturer's declaration - electromagnetic immunity

The HVO-4000MT is intended for use in the electromagnetic environment specified below. The customer or the user of the HVO-4000MT should assure that it is used in such as environment.

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment-guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 Vrms	<p>Portable and mobile RF communications equipment should be used no closer to any part of the HVO-4000MT, including cables, than the recommended separation distance calculated from the equation appliance to the frequency of the transmitter.</p> <p><b>Recommended separation distance</b></p> $d = 1.2 \sqrt{P}$ <p><math>d = 1.2 \sqrt{P}</math> 80 MHz to 800 MHz</p> <p><math>d = 2.3 \sqrt{P}</math> 800 MHz to 2.5 GHz</p> <p>Where <math>P</math> is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and <math>d</math> is the recommended separation distance in meters (m).</p> <p>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, <sup>a</sup> should be less than the compliance level in each frequency range. <sup>b</sup></p> <p>Interference may occur in the vicinity of equipment marked with following symbol:</p> <div style="text-align: center;">  </div>
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3 V/m	

NOTE 1: At 80 MHz and 800 MHz, the higher frequency range applies.

NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

<sup>a</sup> Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy.

To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the HVO-4000MT is used exceeds the applicable RF compliance level above, the HVO-4000MT should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the HVO-4000MT.

<sup>b</sup> Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

**Recommended separation distances between portable and mobile RF communications equipment and the HVO-4000MT**

The HVO-4000MT is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled.

The customer or the user of the HVO-4000MT can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the HVO-4000MT as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter W	Separation distance according to frequency of transmitter m		
	150 kHz to 80 MHz $d = 1.2 \sqrt{P}$	80 MHz to 800 MHz $d = 1.2 \sqrt{P}$	800 MHz to 2.5 GHz $d = 2.3 \sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23

For transmitters rated a maximum output power not listed above, the recommended separation distance  $d$  in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where  $P$  is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1: At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

**CAUTION**

When you dispose of the unit or accessories, you must obey the laws in the relative area or country and the regulations in the relative hospital regarding environmental pollution.



**WARNING**

**Using this unit for medical purposes**

The connectors on this unit are not isolated.

Always use USB-compatible external hard drives and USB memory devices that operate solely on the power supplied by the unit.

Connecting a device that operates on an AC power supply may result in an influx of leakage currents from the connected device, which may in turn result in electric shocks to the patient and operator.

If use of such devices cannot be avoided, be sure to connect an isolation transformer to the power supply of the connected device or connect an isolator between the connection cables to isolate the power supply, and verify that the risk of electric shock from the system has been sufficiently reduced to levels that conform to IEC60601-1 standards.



**WARNING**

**Using this unit for medical purposes**

This equipment's connectors are not isolated.

Do not connect any device other than one which conforms to IEC60601-1.

When an information technology device or AV device that uses an alternating current is connected, current leakage may result in an electric shock to the patient or operator.

If use of such a device is unavoidable, isolate its power supply by connecting an isolation transformer, or by connecting an isolator between the connecting cables.

After implementing these measures, confirm that the reduced risk now conforms to IEC60601-1.



### WARNING on power connection

Use a proper power cord for your local power supply.

- 1 Use the approved Power Cord (3-core mains lead) / Appliance Connector / Plug with earthing-contacts that conforms to the safety regulations of each country if applicable.
- 2 Use the Power Cord (3-core mains lead) / Appliance Connector / Plug conforming to the proper ratings (Voltage, Ampere). If you have questions on the use of the above Power Cord / Appliance Connector / Plug, please consult a qualified service personnel.



### WARNING on power connection for medical use

Please use the following power supply cord. With connectors (plug or female) and cord types other than those indicated in this table, use the power supply cord that is approved for use in your area.

	United States and Canada
Plug Type	HOSPITAL GRADE*
Cord Type	Min. Type SJT
	Min. 18 AWG
Minimum Rating for Plug and Appliance Couplers	10A/125V
Safety Approval	UL Listed and CSA

\* Note: Grounding reliability can only be achieved when the equipment is connected to an equivalent receptacle marked 'Hospital Only' or 'Hospital Grade'.

### CAUTION Network connector (RJ-45)

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.

#### WARNING

Batteries shall not be exposed to excessive heat such as sunshine, fire or the like.



#### Caution

Do not come into contact with the terminals of the rear panel connectors and patients at the same time. Doing so may result in a generation of voltage that can be harmful to patients if the unit is malfunctioning. Always disconnect the power cord before connecting and disconnecting connectors.



#### Caution

Do not come into contact with the unit's internal circuits and patients at the same time. Doing so may result in a generation of voltage that can be harmful to patients if the unit is malfunctioning.

### Note

To prevent the interior of the unit from overheating, keep the rear of the unit completely clear, and maintain a clearance of at least 10 cm (4 in.) around the rest of the unit.

### WARNING

Excessive sound pressure from earphones and headphones can cause hearing loss. In order to use this product safely, avoid prolonged listening at excessive sound pressure levels.

## For the State of California, USA only

Perchlorate Material - special handling may apply, See  
[www.dtsc.ca.gov/hazardouswaste/perchlorate](http://www.dtsc.ca.gov/hazardouswaste/perchlorate)

### For the customers in the U.S.A.

**SONY LIMITED WARRANTY** - Please visit

<http://www.sony.com/psa/warranty> for important information and complete terms and conditions of Sony's limited warranty applicable to this product.

### For the customers in Canada

**SONY LIMITED WARRANTY** - Please visit

<http://www.sonybiz.ca/pro/lang/en/ca/article/resources-warranty-product-registration> for important information and complete terms and conditions of Sony's limited warranty applicable to this product.

### For the customers in Europe

Sony Professional Solutions Europe - Standard Warranty and Exceptions on Standard Warranty.

Please visit <http://www.pro.sony.eu/warranty> for important information and complete terms and conditions.

### For the customers in Korea

**SONY LIMITED WARRANTY** - Please visit

<http://bpeng.sony.co.kr/handler/BPAS-Start> for important information and complete terms and conditions of Sony's limited warranty applicable to this product.

## For the customers in Taiwan only



廢電池請回收

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- Sony assumes no responsibility for damages, loss of income, or any claims from a third party arising out of use of the recorder or supplied software.
- For complete terms and conditions of the warranty for the recorder, refer to the warranty card included in the package.
- The software supplied with the recorder cannot be used with any other recorders.
- It is not possible to install any software into the equipment other than the software supplied by Sony specifically for use with the equipment.
- Note that the specifications of the recorder and supplied software are subject to change for improvement without prior notice.

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# Please Read First

## Copyright

Using this unit for video and/or audio recording, or distribution over the network or otherwise may in some cases require the permission of the copyright holder of the video or audio. To protect copyright, observe the following points carefully when using this unit.

- When connecting a recording device to this and recording video or audio, carefully observe laws relating to copyright.
- Without the permission of the copyright holder, the showing or distribution of video or audio material of which the copyright is held by a third party, or the act of recording on the hard disk of this unit, sharing folders, and permitting of access to a private group or to the public is prohibited by law.
- With a software upgrade or functional extension, with the object of protecting copyright, the specifications for the video and audio signals that can be input may be changed without notice.
- Under copyright law, you may not use recorded video or audio other than for your personal enjoyment without the permission of the copyright holder. Note that at live performances, shows and exhibitions, even for your personal entertainment shooting may be restricted.

## Disclaimer of Liability for Recorded Data

Sony Corporation does not accept any liability whatsoever for any problems arising from a failure to record, or from damage or erasure of recorded content on this equipment, for any reason. This includes claims for compensation of recorded content, and for any concomitant and consequential damages. Sony Corporation will not repair, restore, or duplicate any recorded content. Your use of this product is subject to these conditions.

Problems may occur if you perform the following operations:

- When you use a disc recorded using this unit with another BD (Blu-ray Disc)/DVD recorder or the BD/DVD drive of a personal computer. Discs recorded using this unit will not play back on other BD/DVD recorders.
- When you attempt to re-use a disc with this unit, after using it in the operations described above.
- When you use a disc recorded using another BD/DVD recorder or BD/DVD drive of a personal computer with this unit. Discs recorded using other BD/DVD recorders or computers will not play back on this unit.

## Deletion of data when disposing of the unit

Before disposing of the unit, you first must delete patient data and other confidential information that is stored therein.

Failure to delete stored data before disposing of the unit could expose confidential information to third parties. If you have any questions in this regard, contact your Sony dealer.

## On security

SONY WILL NOT BE LIABLE FOR DAMAGES OF ANY KIND RESULTING FROM A FAILURE TO IMPLEMENT PROPER SECURITY MEASURES ON TRANSMISSION DEVICES, UNAVOIDABLE DATA LEAKS RESULTING FROM TRANSMISSION SPECIFICATIONS, OR SECURITY PROBLEMS OF ANY KIND.

Depending on the operating environment, unauthorized third parties on the network may be able to access the unit. When connecting the unit to the network, be sure to confirm that the network is protected securely.

## On condensation

If the unit is suddenly taken from a cold to a warm location, or if ambient temperature suddenly rises, moisture may form on the outer surface of the unit and/or inside of the unit. This is known as condensation. If condensation occurs, turn off the unit and wait until the condensation clears before operating the unit. Operating the unit while condensation is present may damage the unit.

## LCD panel

The LCD panel fitted to this unit is manufactured with high precision technology, giving a functioning pixel ratio of at least 99.99%. Thus a very small proportion of pixels may be “stuck”, either always off (black), always on (red, green, or blue), or flashing. In addition, over a long period of use, because of the physical characteristics of the liquid crystal display, such “stuck” pixels may appear spontaneously. These problems are not a malfunction. Note that any such problems have no effect on recorded data.

## LCD image display

Due the physical characteristics of LCD panels, there may be a decrease in brightness or change in color temperature over a long period of use. These problems are not a malfunction.

In addition, these occurrences will not affect recorded data.

## On consumable parts

- The HDD, fan, battery, and BD/DVD drive are consumable parts that will need periodic replacement. When operating at room temperature, a normal replacement cycle will be about 2 to 3 years. However, this replacement cycle represents only a general guideline and does not imply that the life expectancy of these parts is guaranteed. For details on parts replacement, contact your dealer.
- The life expectancy of the electrolytic capacitor is about 5 years under normal operating temperatures and normal usage (8 hours per day; 25 days per month). If usage exceeds the above normal usage frequency, the life expectancy may be reduced correspondingly.

## Precautions for products with built-in HDD

This unit has a built-in hard disk drive (HDD). The HDD is a precision device. If subject to shock, vibration, static electricity, high temperature or humidity, data loss can occur. When installing and using the unit, closely observe the following precautions.

### Protect from shocks and vibrations

When subject to shocks or vibrations, the HDD can be damaged and loss of data on the HDD can occur.

- When transporting the unit, use the specified packing material. When transporting on a dolly or similar, use a type which does not transmit excessive vibrations. Excessive shocks and vibrations can damage the HDD.
- Never move the unit while it is powered.
- Do not remove panels or outer parts of the unit.
- When placing the unit on a floor or other surface, make sure that the unit is equipped with the specified rubber feet, and put the unit down carefully. If there are no feet, mount the rubber feet first.
- Do not place the unit near other devices that may become a source of vibrations.

### Wait for 30 seconds after turning power off

For a brief interval after the power is turned off, the platters inside the HDD will still keep spinning and the heads will be in an insecure position. During this interval, the unit is more susceptible to shocks and vibrations than during normal operation. For a period of at least 30 seconds after turning power off, avoid subjecting the unit even to very light shocks. After this period, the hard disk will be fully stopped and the unit can be manipulated.

### Temperature and humidity related precautions

Use and store the unit only in locations where the specified temperature and humidity ranges are not exceeded. (Be sure to use the unit that conforms fully to the specifications of this unit.)

## When HDD seems to be faulty

Even if the HDD is showing signs of malfunction, be sure to observe all the above precautions. This will prevent further damage from occurring until the problem can be diagnosed and corrected.

## Replacement of the HDD and other consumable parts

The HDD and battery are consumable parts that will need periodic replacement. When operating at room temperature, a normal replacement cycle will be about two to three years. However, this replacement cycle represents only a general guideline and does not imply that the life expectancy of these parts is guaranteed. For details on parts replacement, contact your dealer.

## Notes on media

Operation with all optical media or USB media is not guaranteed. Contact your dealer regarding the type of media you intend to use.

---

# Usage Notes

## Do not block the vents

To prevent the interior of the unit from overheating, maintain a clearance of at least 10 cm (4 in.) around the unit.



## Do not subject the unit to severe shocks

The internal mechanism may be damaged or the body warped.

## Do not cover the unit while operating

Doing so will cause temperatures to rise inside the unit, possibly resulting in failure.

## After use

Press the  (on/standby) switch to enter standby mode. If you do not intend to use the unit for an extended period, set the main power switch to the  (off) position after entering standby mode, and then disconnect the power cord.

## Shipping

- Remove the BD/DVD disc before transporting the unit.
- If sending the unit by truck, ship, air or other transportation service, pack it in the shipping carton of the unit.

## Care of the unit

If the casing, or panel becomes dirty, wipe them gently with a soft, dry cloth.

For stubborn dirt, use a cloth wet with mild liquid detergent to wipe the unit, and then wipe it with a dry cloth. Using alcohol, thinner, benzine, insecticides, or other volatile substances may damage the surface of the unit or remove the finish.

Use isopropyl alcohol with a concentration of 50% to 70% (v/v) or ethanol with a concentration of 76.9% to 81.4 % (v/v) to clean the surface of the unit.

## In the event of operating problems

If you should experience problems with the unit, contact your Sony dealer.

## Features

### Improved efficiency during and after medical procedures

#### Video and still image recording

Record videos and still images from endoscopic devices and cameras used in the operating room. 4K compatibility allows recording and playback in high definition.

#### Ch1/Ch2 simultaneous recording

The unit is equipped with a Ch1/Ch2 simultaneous recording function that automatically performs Ch2 recording (2K) during Ch1 recording (4K).

#### Simultaneous saving to external storage media

Data can be saved to external media while it is being recorded to the internal hard disk.

#### Printer connectivity

Connect the unit to a printer, and print images via simple controls from the [Image List] screen. You can also configure settings to print images as they are captured via a foot switch, for example. The printed images can be used in simple medical reports.

#### Support for a variety of external storage media

Record simultaneously to USB-compatible external hard drives and USB memory devices via simple controls, or copy the data at a later time. This is useful when you want to edit recorded images on a computer.



**WARNING**

#### Using this unit for medical purposes

The connectors on this unit are not isolated. Always use USB-compatible external hard drives and USB memory devices that operate solely on the power supplied by the unit. Connecting a device that operates on an AC power supply may result in an influx of leakage currents from the connected device, which may in turn result in electric shocks to the patient and operator.

If use of such devices cannot be avoided, be sure to connect an isolation transformer to the power supply of the connected device or connect an isolator between the connection cables to isolate the power supply, and verify that the risk of electric shock from the system has been sufficiently reduced to levels that conform to IEC60601-1 standards.

#### Editing recorded data

Record images to external media, and use commercially available software to play back or edit the images on a computer as necessary.

*For details on playback and editing software, contact your local Sony representative.*

#### Network file transfer

Transfer recorded data from the operating room directly to computers within the hospital network.



**WARNING**

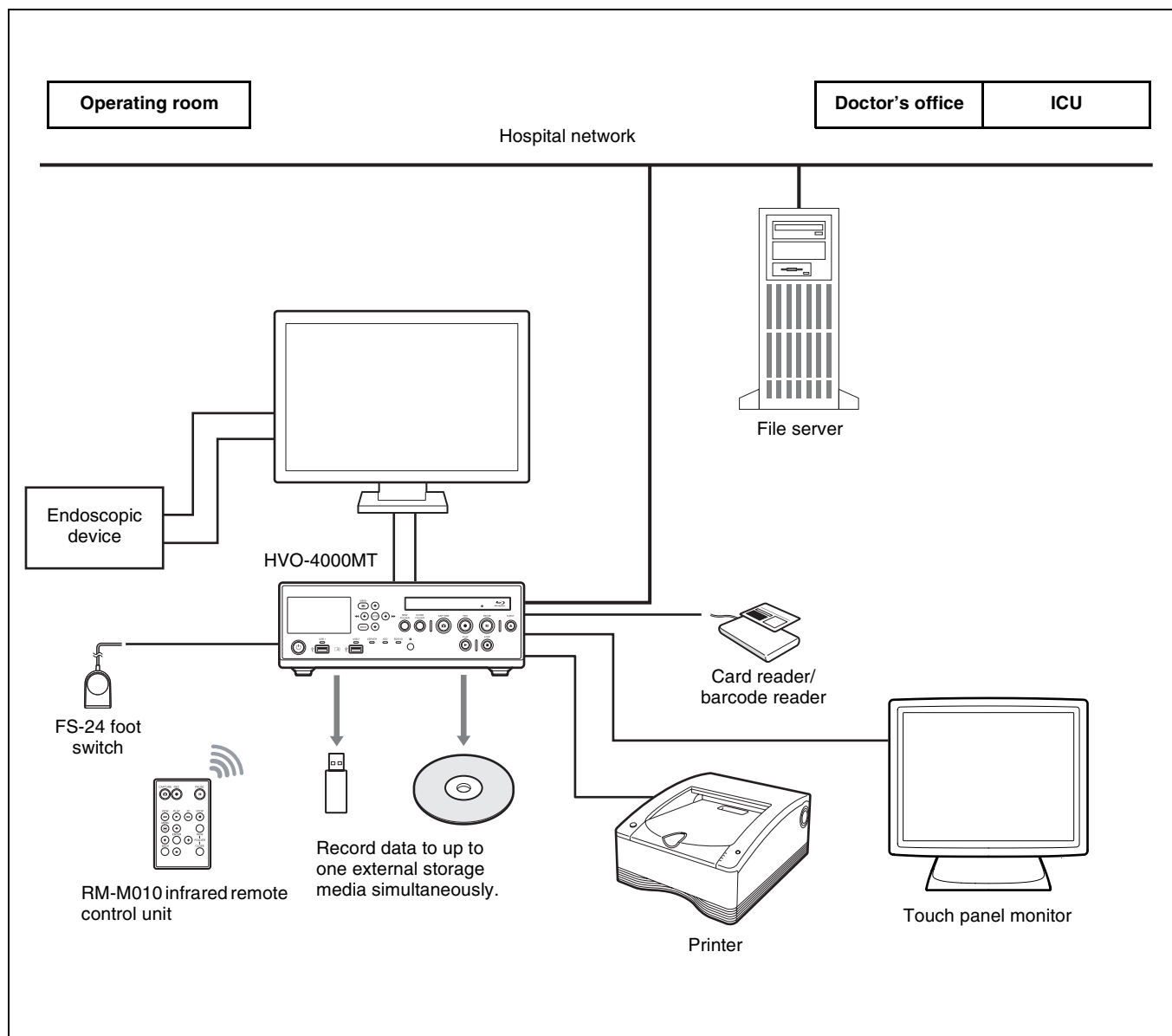
#### Using this unit for medical purposes

This equipment's connectors are not isolated. Do not connect any device other than one which conforms to IEC60601-1.

When an information technology device or AV device that uses an alternating current is connected, current leakage may result in an electric shock to the patient or operator.

If use of such a device is unavoidable, isolate its power supply by connecting an isolation transformer, or by connecting an isolator between the connecting cables. After implementing these measures, confirm that the reduced risk now conforms to IEC60601-1.

# System Configuration Example

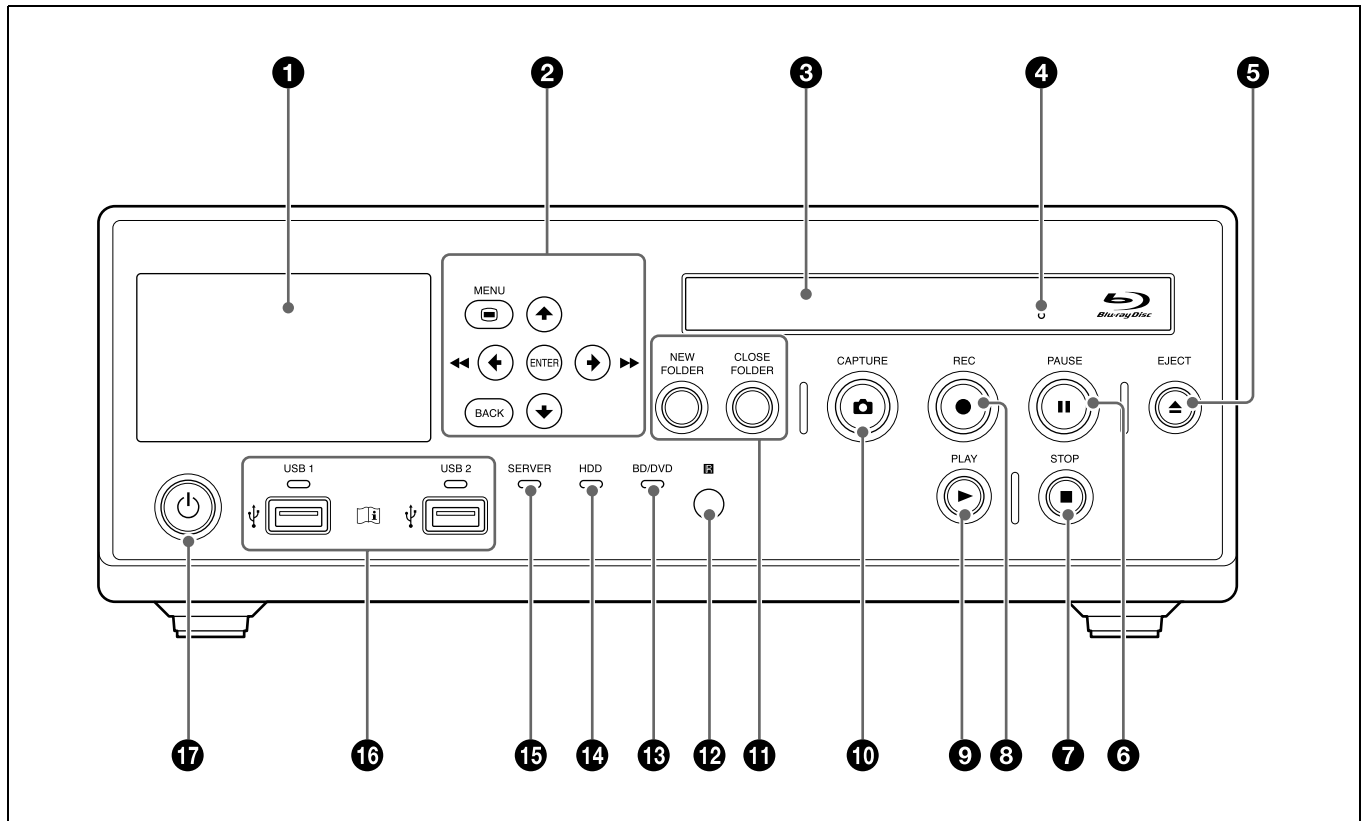


## Caution

The FS-24 has an Ingress Protection rating of IPx3. Therefore, do not operate it in environments exposed to splashing liquids (e.g., surgical operating rooms). For safety, use a device with a rating of IPx6 or higher when operating in such environments.

# Names and Functions of Parts

## Front



### Note

#### Do not touch the laser pickup inside the BD drive

The discharge of static electricity that may result from touching the pickup may cause the drive to hang up, preventing the ability to write data. If a hang up occurs, try turning the recorder off and turning it on again.

#### 1 Front panel display

Displays Ch1 input/output videos and still images, the status of the unit, error messages, etc.

#### 2 Menu navigation buttons

Use these to navigate menus.

##### MENU button

Display or hide the menu.

##### ↑ button

Use this to move the cursor up or select an item that is above the current item.

##### ←/◀ button

Use this to move the cursor left or select an item that is to the left of the current item.

You can also use this button to rewind during playback of recorded data.

##### ↓ button

Use this to move the cursor down or select an item that is below the current item.

##### →/▶▶ button

Use this to move the cursor right or select an item that is to the right of the current item.

You can also use this button to fast forward during playback of recorded data.

##### ENTER button

Use this to confirm a currently selected menu or item, and execute operations.

##### BACK button

Use this to return to a previous screen during menu or operation screen displays.

When you press this button while nothing is displayed on the screen, the text that appears on the front panel display will be hidden.

**3 Disc tray**

Insert discs here.

**4 Emergency eject hole**

If the disc tray does not open when you press the ▲ EJECT button, insert a long, thin object such as a straightened paper clip into this hole to open the disc tray.

**5 ▲ EJECT button**

Use this to open the disc tray.

**6 II PAUSE button**

Use this while recording is in progress to pause recording. Press this button again to resume recording. A chapter separator is also created at the position in which recording was paused. You can also use this button to pause playback. To resume playback, press this button again or press the ► PLAY button. “PAUSE” appears on the front panel display during pause.

**7 ■ STOP button**

Use this to stop recording or playback. A title separator is also created at the position in which recording was stopped.

**8 ● REC button**

Use this to start video/audio recording. During recording, “REC” appears on the front panel display in addition to the recording time.

*For details on use, see “Manual Recording” (page 46).*

**9 ► PLAY button**

- Use this to play back the most recent recorded data stored on the internal hard disk, or to play back the recorded data selected in the [Recording List] or [Image List] screen.
- Press this button while playback is paused to resume playback.

**10 📷 CAPTURE button**

Use this to capture still images. A chapter separator is also created at the position in which the still image was captured.

*For details on use, see “Capture Still Images” (page 47).*

**11 NEW FOLDER button**

Use this to display the [Recording Preparation] screen to start recording a new surgical procedure or examination.

*For details on use, see “Recording Preparation” (page 43).*

**CLOSE FOLDER button**

Use this to display the [End Recording] screen which is used to end surgical procedure or examination recordings.

*For details on use, see “Step 4: End Recording” (page 42).*

**12 📡 Infrared receiver**

Point the infrared remote control unit toward this receiver.

**13 BD/DVD indicator**

Displays the status of the BD/DVD drive.

Indicator	Status
Blinking green	Data is being written to the BD/DVD disc.
Lit green	The recording area of the BD/DVD disc is full. Insert a different disc.
Lit orange	An error has occurred.

**Note**

You cannot remove the disc when this indicator is blinking green.

**14 HDD indicator**

Displays the status of the internal hard disk.

Indicator	Status
Blinking green	Data is being recorded to the internal hard disk.
Lit orange	An error has occurred. The recording area of the internal hard disk is full. Delete any unnecessary recorded data.

**15 SERVER indicator**

Displays the server access status.

Indicator	Status
Blinking green	The server is being accessed.
Lit orange	An error has occurred. The recording area of the server is full.

**16 ↔ USB ports/indicators 1 and 2**

Connect USB memory devices, external hard disks, and other USB media here.

The indicators display the status of USB media access.

Indicator	Status
Blinking green	Data is being written to the USB media.

Indicator	Status
Lit green	The recording area of the USB media is full. Delete any unnecessary recorded data, or insert different media.
Lit orange	An error has occurred.

**Note**

Never remove USB media when these indicators are blinking green.

**Tip**

**Supported USB devices**

- Use Sony USB media.
- The connectors do not support all USB devices.
- USB hubs and devices with built-in hubs are not supported.



**Using this unit for medical purposes**

The connectors on this unit are not isolated. Always use USB-compatible external hard drives and USB memory devices that operate solely on the power supplied by the unit. Connecting a device that operates on an AC power supply may result in an influx of leakage currents from the connected device, which may in turn result in electric shocks to the patient and operator.

If use of such devices cannot be avoided, be sure to connect an isolation transformer to the power supply of the connected device or connect an isolator between the connection cables to isolate the power supply, and verify that the risk of electric shock from the system has been sufficiently reduced to levels that conform to IEC60601-1 standards.

**17 ⏻ (on/standby) switch/indicator**

Use this switch to turn on the unit and the front panel display. Press this switch again to turn off the unit and enter standby mode.

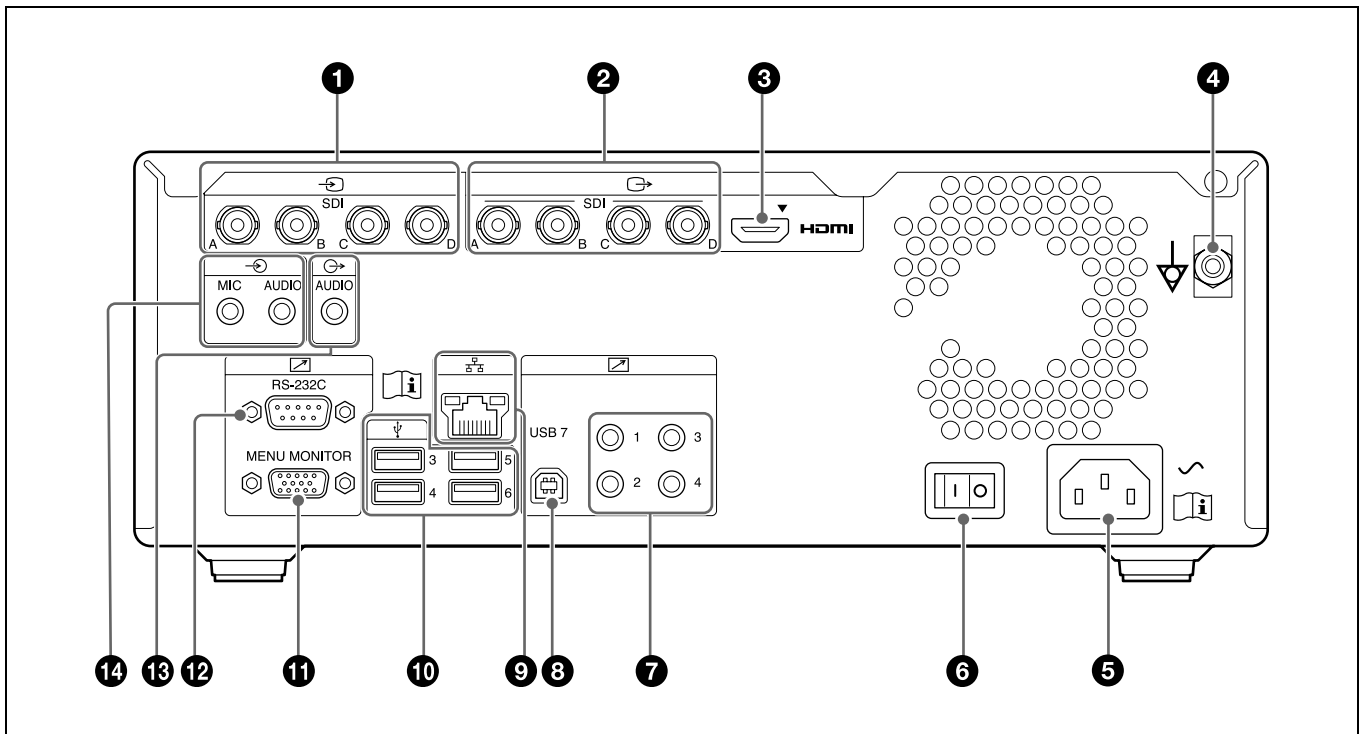
The indicator indicates the following.

Indicator	Status
Off	The main power switch on the rear panel is set to the O (off) position.
Lit orange	Standby mode. (The main power switch on the rear panel is set to the I (on) position.)
Lit green	The unit is turned on. (The ⏻ (on/standby) switch was pressed to turn on the unit.)

**Tip**

The indicator will turn off about 15 seconds after the main power switch on the rear panel is turned off from the standby state.

**Rear**



**WARNING****Using this unit for medical purposes**

This equipment's connectors are not isolated. Do not connect any device other than one which conforms to IEC60601-1.

When an information technology device or AV device that uses an alternating current is connected, current leakage may result in an electric shock to the patient or operator.

If use of such a device is unavoidable, isolate its power supply by connecting an isolation transformer, or by connecting an isolator between the connecting cables. After implementing these measures, confirm that the reduced risk now conforms to IEC60601-1.

**Caution****Using this unit for medical purposes**

Do not come into contact with the terminals of the rear panel connectors and patients at the same time. Doing so may result in a generation of voltage that can be harmful to patients if the unit is malfunctioning. Always disconnect the power cord before connecting and disconnecting connectors.

- ①  **SDI input connectors A to D (BNC type)**  
Inputs SDI signals (3G SDI).

**Tips**

- If SDI input images are not displayed, turn on the unit first and make sure that startup is complete before turning on the video input device.
- When receiving 4K signals, the four SDI inputs must be synchronized.
- Embedded audio is not supported.


- ②  **SDI output connectors A to D (BNC type)**  
Outputs SDI signals (3G SDI).

- ③  **HDMI output connector (Type A)**  
Outputs HDMI signals.

**Note**


We recommend using a Sony HDMI cable (not supplied).

- ④  **Equipotential grounding terminal**  
Use this for equipotential grounding connections.


- ⑤  **AC IN connector**  
Connect a power cord (not supplied) here.

**⑥ Main power switch**

Set this to the **I** (on) position to turn on the power. To turn off the power, set the switch to the **O** (off) position.

During regular use of the unit, leave the main power switch in the **I** (on) position, and use the **17**  (on/standby) switch on the front panel of the unit to switch between operational mode and standby mode.


**Note**

When you press the **17**  (on/standby) switch on the front panel of the unit while the unit is in operational mode, data is saved before the unit enters standby mode. Always make sure that the unit is in standby mode before setting the main power switch to the **O** (off) position to turn off the power.

**⑦  REMOTE contact switch connectors 1 to 4 (stereo mini jack)**

Use these to control the unit via contact switches.

*For details on contact switches, see “[Contact Switch] Tab” (page 65).*

**⑧  USB port 7 (Type B / USB 2.0)**

Use this to perform system controls from an external device.


For details on system controls, see “[Control] Tab” (page 64).

**⑨  Network connector (RJ-45)**

Connect a 1000 Base-T or 100 Base-TX network cable here.

**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.

**⑩  USB ports 3 to 6 (Type A / USB 2.0)**

Connect USB devices here.

**Tip****Supported USB devices**

- Use Sony USB media.
- The connectors do not support all USB devices.
- USB hubs and devices with built-in hubs are not supported.

**WARNING****Using this unit for medical purposes**

The connectors on this unit are not isolated. Always use USB-compatible external hard drives and USB memory devices that operate solely on the power supplied by the unit.

Connecting a device that operates on an AC power supply may result in an influx of leakage currents from the connected device, which may in turn result in electric shocks to the patient and operator.

If use of such devices cannot be avoided, be sure to connect an isolation transformer to the power supply of the connected device or connect an isolator between the connection cables to isolate the power supply, and verify that the risk of electric shock from the system has been sufficiently reduced to levels that conform to IEC60601-1 standards.


**11**  **MENU MONITOR connector (15-pin mini D-sub)**

Connect a touch panel monitor or similar device here.

**12**  **RS-232C connector (9-pin D-sub)**

Use this to perform system controls from an external device.

For details on system controls, see “[Control] Tab” (page 64).

**13**  **AUDIO (analog audio signal) output connector (stereo mini jack)**

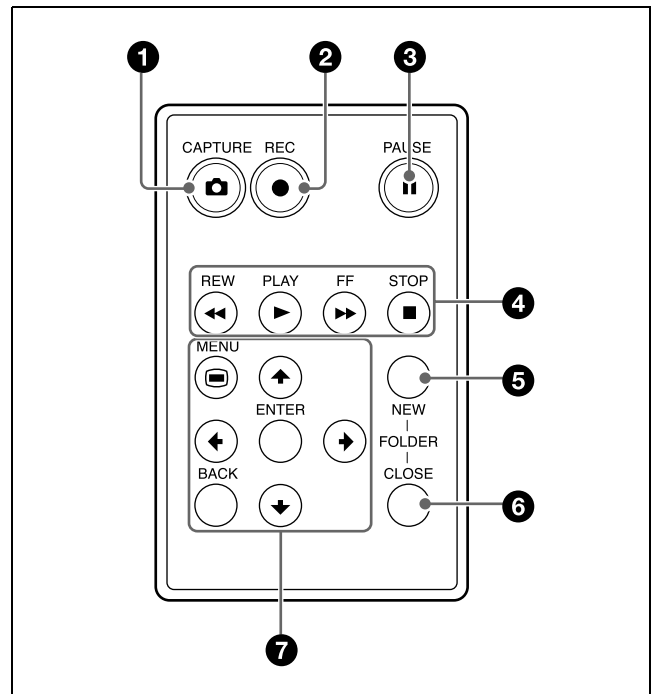
Outputs analog audio signals.

**14**  **MIC input connector (stereo mini jack)**

Inputs analog audio signals from the microphone. You can configure settings to supply power from the unit.

 **AUDIO (analog audio signal) input connector (LINE) (stereo mini jack)**

Inputs analog audio signals.

**Infrared Remote Control Unit (RM-M010)**

**1**  **CAPTURE button**

Use this to capture still images.

A chapter separator is also created at the position in which the still image was captured.

For details on use, see “Capture Still Images” (page 47).

**2**  **REC button**

Use this to start video/audio recording.

During recording, “REC” appears on the front panel display in addition to the recording time.

For details on use, see “Manual Recording” (page 46).

**3**  **PAUSE button**

Use this while recording is in progress to pause recording. Press this button again to resume recording.

A chapter separator is also created at the position in which recording was paused.

You can also use this button to pause playback.

To resume playback, press this button again or press the ► PLAY button.

“PAUSE” appears on the front panel display during pause.

**4**  **REW button**

Use this to rewind during playback of recorded data.

### ▶ **PLAY button**

- Use this to play back the most recent recorded data stored on the internal hard disk, or to play back the recorded data selected in the [Recording List] or [Image List] screen.
- Press this button while playback is paused to resume playback.

### ▶▶ **FF button**

Use this to fast forward during playback of recorded data.

### ■ **STOP button**

Use this to stop recording or playback.  
A title separator is also created at the position in which recording was stopped.

### 5 **NEW FOLDER button**

Use this to display the [Recording Preparation] screen to start recording a new surgical procedure or examination.

*For details on use, see “Recording Preparation” (page 43).*

### 6 **CLOSE FOLDER button**

Use this to display the [End Recording] screen which is used to end surgical procedure or examination recordings.

*For details on use, see “Step 4: End Recording” (page 42).*

### 7 **Menu navigation buttons**

Use these to navigate menus.

#### ☐ **MENU button**

Display or hide the menu.

#### ↓ **button**

Use this to move the cursor down or select an item that is below the current item.

#### → **button**

Use this to move the cursor right or select an item that is to the right of the current item.

#### **ENTER button**

Use this to confirm a currently selected menu or item, and execute operations.

#### ← **button**

Use this to move the cursor left or select an item that is to the left of the current item.

#### ↑ **button**

Use this to move the cursor up or select an item that is above the current item.

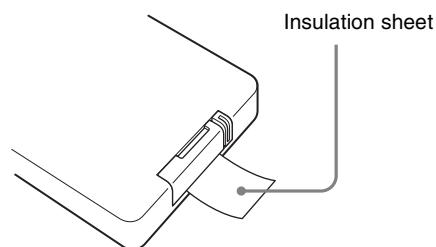
### **BACK button**

Use this to return to a previous screen during menu or operation screen displays.

When you press this button while nothing is displayed on the screen, the text that appears on the front panel display will be hidden.

## **Before using the remote control unit**

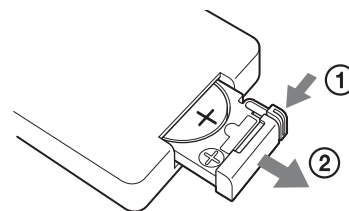
Remove the insulation sheet.



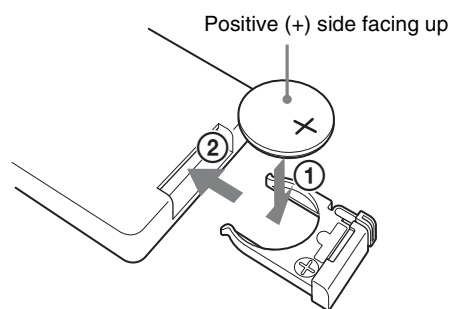
## **To replace the lithium battery**

Use a Sony CR2025 lithium battery. Do not use any other type of battery with the remote control unit.

- 1 While holding in the lock lever (①), pull out the battery holder (②).



- 2 Insert the replacement battery with the positive (+) side facing up (①), and reinsert the battery holder until it clicks into place (②).



### **WARNING**

Batteries shall not be exposed to excessive heat such as sunshine, fire or the like.

### **CAUTION**

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

When you dispose of the battery, you must obey the law in the relative area or country.

### Battery lifetime

When the lithium battery output falls, even button presses may not operate. The average lithium battery lifetime is about one year, but this depends on the pattern of use. If pressing the remote control buttons produces absolutely no effect on this unit, replace the battery, then check the operation again.

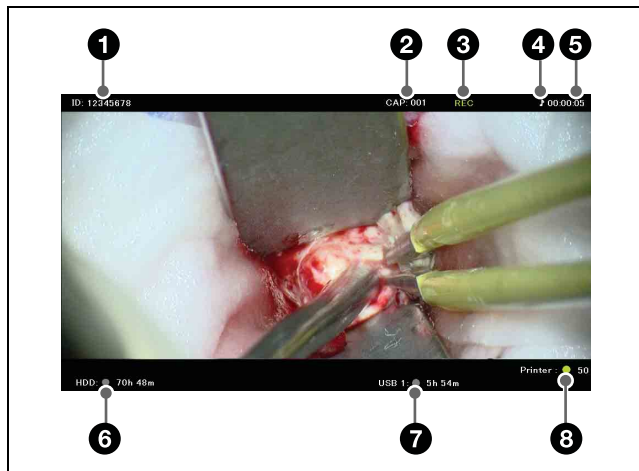
## Status Displays

The following information is displayed when the status display settings are enabled.

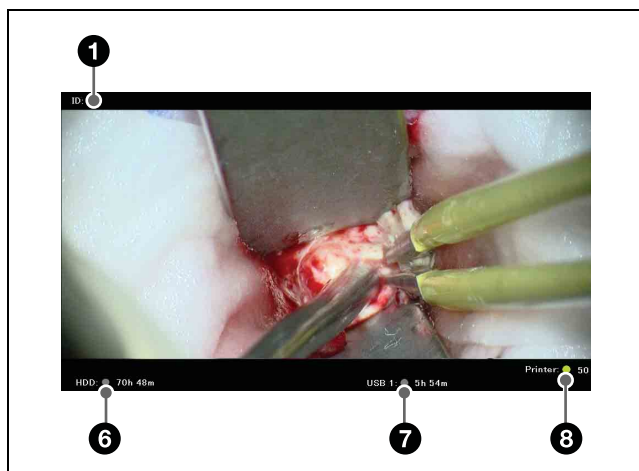
*The status display settings are configured in the [System Admin Settings] screen – [Function Settings] screen – [General 1] tab. For details on this setting, see “[General 1] Tab” (page 60).*

### Rec status display / idle status display

#### Rec status displays



#### Idle status displays



- 1 **Patient ID**  
Displays the patient ID.
- 2 **Capture counter**  
Displays the number of still images captured.
- 3 **Recording status**  
Displays the recording status.  
**REC:** Recording is in progress.  
**REC PAUSE:** Recording has been paused.  
**REC STOP:** Recording preparation is complete or recording has been stopped.
- 4 **Audio recording status**  
Displays the audio recording status.  
♪: Audio recording is in progress.  
**no display:** Audio is not being recorded.
- 5 **Recording time**  
The recording time is counted in seconds and displayed in “HH:MM:SS” a format.
- 6 **HDD status**  
Displays the internal HDD status and the remaining time.  
The status color indicates the following.  
**Green:** Recording is in progress or still image recording is in progress.  
**Orange:** The maximum number of recorded data entries has been exceeded or the internal HDD is full.  
**Gray:** Status other than the above.
- 7 **External media status**  
Displays the status of the external media and the remaining capacity time.  
The status color indicates the following.
  - When transferring to BD/DVD
    - Green:** Transfer or formatting is in progress.
    - Orange:** Additional recording to the BD/DVD is not possible, an unsupported BD/DVD is inserted, the maximum number of BD/DVD exchanges has been exceeded, or a finalized DVD is inserted.
    - Gray:** Status other than the above.
  - When transferring to USB
    - Green:** Transfer is in progress.
    - Orange:** An unsupported USB memory device is inserted, the maximum number of USB memory device exchanges has been exceeded, or a transfer error has occurred.
    - Gray:** Status other than the above.
  - When transferring to a server
    - Green:** Transfer is in progress.
    - Orange:** Insufficient server capacity or a transfer error has occurred.
    - Gray:** Status other than the above.

### 8 Print status

Displays the printer status and the remaining number of print sheets.

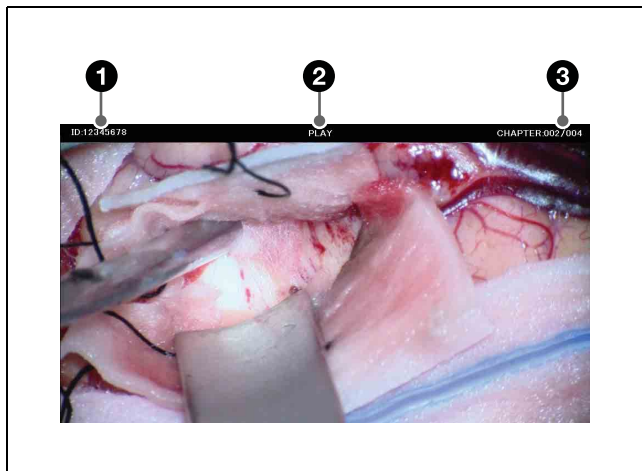
The status color indicates the following.

**Green:** Still image printing is in progress.

**Orange:** A print error has occurred.

**Gray:** Status other than the above.

## Playback status displays



### 1 Patient ID

### 2 Playback status

Displays the playback status.

**PLAY:** Video playback is in progress.

**FF x2 to FF x60:** Fast forward at x2 to x60 speed is in progress.

**REW x2 to REW x60:** Rewind at x2 to x60 speed is in progress.

**PAUSE:** Playback has been paused.

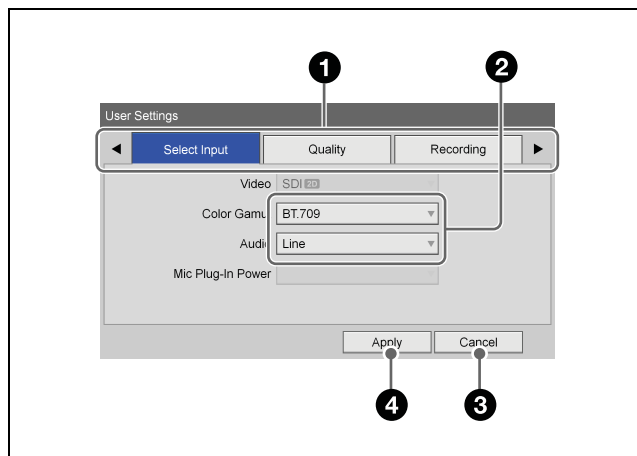
### 3 Video chapter number / still image playback status

**CHAPTER:xxx/xxx:** Displays the number of the chapter being played back.

**STILL:xxx/xxx:** Displays the number of the still image being played back.

## Setting Screens

### Example: [User Settings] screen



### 1 Tabs

The setting screens consist of tabs.

To switch between tabs, use the ◀ and ▶ buttons on the front panel or remote control to select the desired tab.

If additional tabs exist before and after the displayed tab, ◀ (previous) and ▶ (next) are also displayed.

The tabs will be displayed in sequence when you select ◀ and ▶.

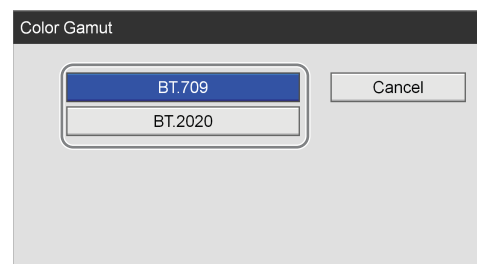
### 2 Setting item

Use the ↑, ↓, ←, and → buttons to select an item, and press the ENTER button to display the setting screen for that item. You can select or enter setting values in the screens that appear.

#### Example: When selecting a setting value

Select the item, and press the ENTER button.

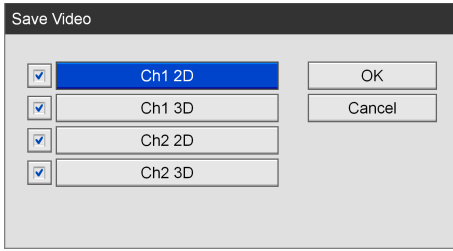
The previous screen will appear again, and the setting value will be entered.



#### Example: When selecting check boxes

Select the item and press the ENTER button to select the check box. The check box will be selected/cleared with each press of the ENTER button. (Multiple selections can be made.)

When you select [OK] and press the ENTER button, the previous screen appears again with the setting value entered.



- 3 [Cancel] Select this button and press the ENTER button to cancel the settings and close the setting screen.
- 4 [Apply] Select this button and press the ENTER button to save the settings and close the setting screen.

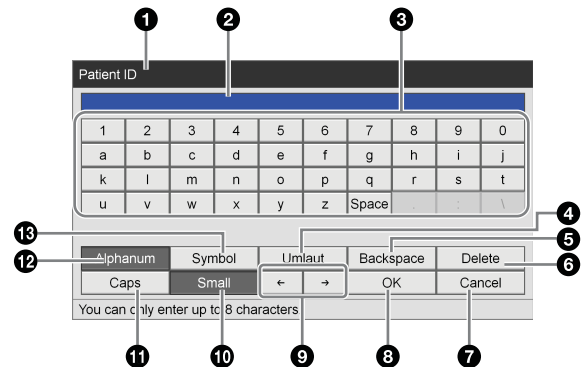
## Using the On-Screen Keyboard (Text Entry)

When text entry is necessary, an on-screen keyboard appears.

### Names and Functions of Parts (On-Screen Keyboard)

You can display an alphanumeric, symbol, or umlaut character set on the on-screen keyboard. The name and function of each part on the keyboard is as follows.

#### Example: On-screen keyboard during alphanumeric character display



- 1 **Title bar**  
The name of the setting item for which the on-screen keyboard was opened is displayed here.
- 2 **Entry box**  
Characters selected on the keyboard are entered here.

#### Tip

Characters input on a hardware keyboard are also entered here.

- 3 **Keyboard**  
When you select a character you want to input using the **↑**, **↓**, **←**, and **→** buttons and then press the ENTER button, the character is entered in the **2** entry box.
- 4 **[Umlaut]**  
Select this and press the ENTER button to switch the keyboard to umlaut character display.

- 5 **[Backspace]**  
Select this and press the ENTER button to discard the character immediately preceding the cursor.
- 6 **[Delete]**  
Select this and press the ENTER button to discard the character immediately following the cursor.
- 7 **[Cancel]**  
Select this and press the ENTER button to cancel text entry and close the on-screen keyboard.
- 8 **[OK]**  
When you select this and press the ENTER button, the text that appears in the entry box is applied and input in the settings screen.
- 9 **←/→**  
Select this and press the ENTER button to move the cursor one space to the left or right.
- 10 **[Small]**  
Select this and press the ENTER button to switch the keyboard to lower case display.
- 11 **[Caps]**  
Select this and press the ENTER button to switch the keyboard to upper case display.
- 12 **[Alphanum]**  
Select this and press the ENTER button to switch the keyboard to alphanumeric character display.
- 13 **[Symbol]**  
Select this and press the ENTER button to switch the keyboard to symbol display.

---

## Handling Discs

### Compatible discs

This unit supports the following BD and DVD discs.

- DVD-R
- BD-R / BD-R DL
- BD-RE / BD-RE DL

#### Tip

Use Sony discs.

### Disc formatting

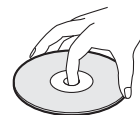
This unit automatically formats new and previously unused discs.

---

## Notes on Handling

### Handling

- Do not touch the recording or playback surface of the disc. Handle the disc by its edge.



- Do not use the following types of disc. Doing so may cause the unit to malfunction.
  - A disc on which a paper label or a seal is attached
  - A disc on which the glue of cellophane tape or a label, or on which a portion of a label still remains
  - A cracked disc
  - A cracked disc which has been mended using glue (or a similar substance)

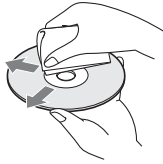


### Storage

- Do not store discs where they may be subjected to direct sunlight, or in other places where the temperature or humidity is high.
- Store discs in their cases.
- Finger prints or dust accumulated on the disc cause deterioration of picture quality. Keep the disc clean.

### Cleaning

- Clean the disc with a soft cloth, wiping it from the center out. If the dust is heavy, wipe it with a soft cloth moistened with water, then wipe off the water with a dry cloth.



- Do not use solvents such as benzene, thinner, commercially available record cleaners, or anti-static spray. Using these products may damage discs.

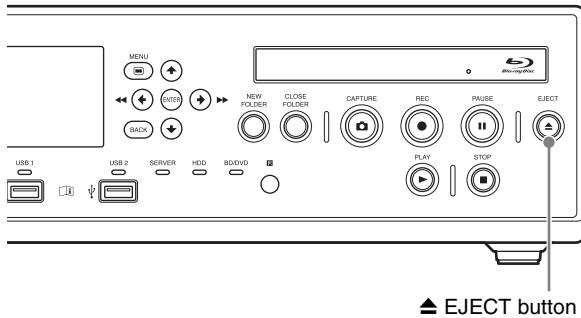
## Inserting and Removing Discs

### To insert a disc

- 1 Turn the unit on.

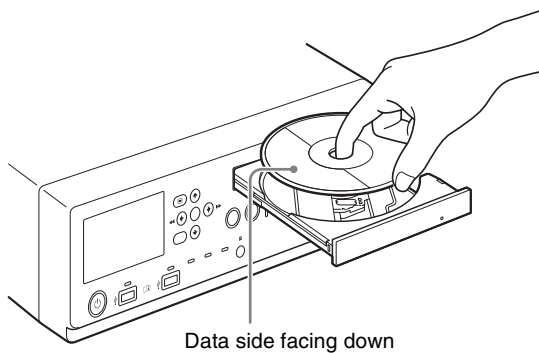
For details, see “To turn on the unit” (page 29).

- 2 Press the ▲ EJECT button.



The disc tray opens.

- 3 Insert the disc.



- 4 Gently push in the disc tray.

The disc tray closes.

### When an incompatible disc is inserted

The BD/DVD indicator lights orange. A message notifying you of the incompatible media also appears on

the menu screen. Remove the disc, and insert a compatible disc.

### To remove a disc

- 1 Press the ▲ EJECT button while the unit is turned on.

The disc tray opens.

- 2 Remove the disc.

- 3 Gently push in the disc tray to close it.

#### Tip

When simultaneously saving to a BD/DVD, the disc tray cannot be opened while recording is in progress or paused.

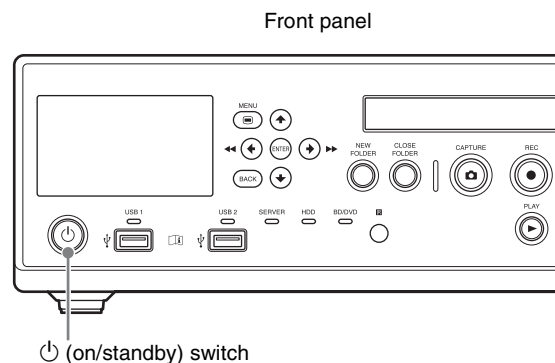
## Connections

- 1 Connect a power cord (not supplied) to the ~ AC IN connector on the rear of the unit.
- 2 Connect the output signal of the medical equipment to SDI-IN connectors A to D on the rear of the unit.
- 3 Connect the plug on the power cord to an AC power supply.
- 4 Turn on the medical equipment that will act as the signal source.

## Turning the Unit On and Off

### To turn on the unit

- 1 Set the main power switch on the rear panel to the I (on) position.
- 2 Press the ⏻ (on/standby) switch on the front panel of the unit.



A splash screen appears on the front panel display when the unit turns on.

After “BOOTING...” and then the patient ID, current date, and other information appear on the front panel display, operations can be performed.

### To turn on power or enter standby during normal operation

Use the ⏻ (on/standby) switch on the front panel to switch between turning the unit on and entering the standby mode.

“FINISHING” appears on the front panel display while the unit is shutting down. “GOOD BYE” appears and disappears after shutdown is complete, and the unit enters standby mode.

### During long periods of disuse

Turn off the main power switch on the rear panel of the unit when not using the unit for long periods of time.

**1** Press the ⏻ (on/standby) switch on the front panel of the unit to enter standby mode.

The ⏻ (on/standby) indicator lights orange.

**2** Set the main power switch on the rear panel of the unit to the ○ (off) position.

The power is turned off.

**Tip**

To completely shut off the power supply, set the main power switch to the ○ (off) position, and then disconnect the power cord.

---

## Configuring System Settings

Be sure to configure the system settings before you begin operating the unit. The system settings should be configured by the system administrator.

*For details on system settings, see “System Administrator Settings” (page 56).*

**Tip**

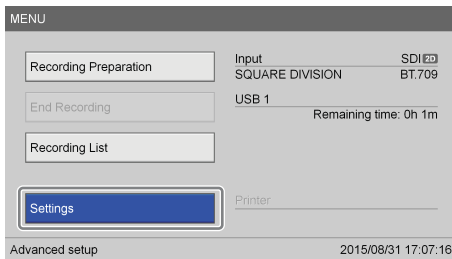
If the system administrator settings are not configured, operations may not be performed as intended in some cases.

# Configuring Recording Settings (User Settings)

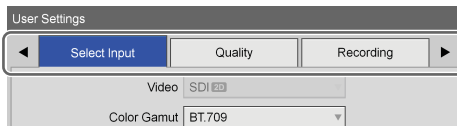
Configure input signal and image quality settings in the [User Settings] screen. You can navigate menus using the navigation buttons on the front panel of the unit.

## Displaying the [User Settings] Screen

- 1 Press the MENU button.  
The [MENU] screen appears.
- 2 Select [Settings], and press the ENTER button.



- The [Settings] screen appears.
- 3 Select [User Settings], and press the ENTER button.  
The [User Settings] screen appears
  - 4 Select a tab, and configure the settings as necessary.



## Configuring Input Signal Settings

Select the video and audio input signals.

- 1 Display the [Select Input] tab, and configure each setting.  
**[Video]**  
Select the video input signal. You can select from [SDI 2D] (2D), [SDI 3D ] (3D line-by-line), and [3D 3D ] (3D top-and-bottom). This item is available when [2D/3D] is set to [Manual] in the [System Admin Settings] screen –

[Function Settings] screen – [Input Detection] tab. When [Auto] is selected, the automatically detected input signal will be displayed. The default setting is [SDI 2D] (2D).

### [Color Gamut]

Select the color gamut for the input signal. You can select from [BT.709] and [BT.2020]. This item is available when [Color Gamut] is set to [Manual] in the [System Admin Settings] screen – [Function Settings] screen – [Input Detection] tab. When [Auto] is selected, the automatically detected color gamut will be displayed. The default setting is [BT.2020].

### [Audio]

Select the audio input format. You can select from [LINE] and [MIC]. The default setting is [LINE].

### [Mic Plug-In Power]

Select whether to supply power to the microphone from the unit. This item is available when [Audio] is set to [MIC]. The default setting is [Not Used]. You can configure the voltage that is supplied in the [System Admin Settings].

- 2 To configure image quality settings, proceed to “Configuring Image Quality Settings” (page 31).

If you are finished configuring settings, select [Apply] and press the ENTER button.

## Configuring Image Quality Settings

Configure image quality settings for videos and still images.

- 1 Display the [Quality] tab, and configure video settings in the [Video] area.

### Tip

The recording capacities displayed in [Rec Time] and [Rec Quantity] are estimations for recording both Ch1 and Ch2 images to single-layer BD discs (25 GB).

### [Quality]

Select the video recording quality. You can select from [Best], [High], and [Standard]. The default setting is [High].

### Tip

The setting specified here will become the default setting for [Video Quality] in the [Recording Preparation] screen.

## 2 Configure still image settings in the [Still] area.

### [Format]

Select the still image format (file format).  
You can select from [Bitmap], [TIFF], and [JPEG].  
The default setting is [Bitmap].

### [Quality]

Select the still image (JPEG) recording quality.  
You can select from [Best], [High], and [Standard].  
This item is available when [Format] is set to [JPEG].  
The default setting is [High].

### [Capture]

Displays the still image format used during image capture.  
This is fixed at [Frame] on the unit.

## 3 To configure recording settings, proceed to “Configuring Recording Settings (User Settings)” (page 31).

If you are finished configuring settings, select [Apply] and press the ENTER button.

---

## Configuring Recording Settings

### 1 Display the [Recording] tab, and configure recording settings.

#### [Ch1/Ch2 Rec Mode]

Select the recording mode.  
You can select from [Ch1 Rec] and [Ch1/Ch2 Simul Rec].  
The default setting is [Ch1/Ch2 Simul Rec].

*For details on Ch1/Ch2 simultaneous recording, see “Using the Ch1/Ch2 Simultaneous Recording Function” (page 48).*

#### [Ch2 Rec Format]

Select 3D or 2D for the Ch2 recording format.

#### Tips

- When [Ch1/Ch2 Rec Mode] is set to [Ch1/Ch2 Simul Rec], the [Link On] (Ch1/Ch2 link) setting for the touch panel monitor will be turned on (green).
- 3D recording will be performed according to the input signal format. However, images will be recorded in top-and-bottom format when the input is a line-by-line format.
- When [CMS Mode] is set to [Use] in the [System Admin Settings] screen – [Function Settings] screen – [CMS] tab, [Ch1/Ch2 Rec Mode] will be fixed at [Ch1/Ch2 Simul Rec]. In addition, [Ch2 Rec Format] will be fixed at its current setting.

### [Convert Color Gamut]

Select the conversion format for the recorded color depth.  
You can select from [Do Not Convert], [Ch1/Ch2 to BT.709] and [Ch2 to BT.709].  
The default setting is [Ch2 to BT.709].

### [4K Convert Mode]

Select the method used to convert to 3840×2160 resolution when 4096×2160 resolution signals are input.  
You can select from [Cut] and [Downconvert].  
The default setting is [Cut].

*For details on the actual images that are converted when [Cut] or [Downconvert] is configured, see “4K Convert Modes” (page 37).*

#### Note

When using 3D input signals, [Cut] mode will be used regardless of the [4K Convert Mode] setting.

## 2 To configure save settings, proceed to “Configuring Save Settings” (page 32).

If you are finished configuring settings, select [Apply] and press the ENTER button.

---

## Configuring Save Settings

Configure settings related to storage destinations for recorded data and simultaneous transfer, and specify whether to output metadata.

### 1 Display the [External Storage 1] tab, and configure settings related to storage destinations for recorded data.

#### [Ch1 External Storage]

Select the external storage media that will be used when performing simultaneous recording.  
You can select from [Not Specified], [BD/DVD], [USB 1], [USB 2], [SERVER], and [Auto-Detect].  
The default setting is [Not Specified].  
When [CMS Mode] is set to [Use] in the [System Admin Settings] screen – [Function Settings] screen – [CMS] tab, the setting will be fixed at the current selection.

#### [Ch2 External Storage]

The external storage media selected in [Ch1 External Storage] appears here.

#### [Record Save to Media]

Select the external storage media that will be used when copying recording lists and image lists from the [Recording List] and [Image List] screens.

You can select from [BD/DVD], [USB 1], [USB 2], and [SERVER].

The default setting is [USB 1].

### [Folder Structure]

Select the directory structure that will be used when writing to external destinations.

You can select from [Date + Patient ID] and [Patient ID].

The default setting is [Date + Patient ID].

When [CMS Mode] is set to [Use] in the [System Admin Settings] screen – [Function Settings] screen – [CMS] tab, the setting will be fixed at the current selection.

#### Tip

When recorded data with the same patient ID is created, a new recording date folder is created under the patient ID folder, and the recorded data is saved to the new folder.

- 2 Display the [External Storage 2] tab, and configure settings related to simultaneous transfer.

### [Save Video]

Select the check boxes of the video formats that will be simultaneously transferred. (Multiple selections can be made.)

You can select from [Ch1 2D], [Ch1 3D], [Ch2 2D], and [Ch2 3D].

All of the check boxes are selected under default settings.

### [Save Still]

Select the check boxes of the storage formats for 3D still images. (Multiple selections can be made.)

You can select from [3D], [2D], [Convert to 2D DICOM], [2D Left], [Convert to 2D DICOM Left], [2D Right], and [Convert to 2D DICOM Right].

All of the check boxes are selected under default settings.

#### Tips

- When [Save Still] is set to [3D], the data will be saved in MPF format.
- When none of the check boxes are selected, [Save Video] and [Save Still] will be blank. When multiple formats are selected, they will be displayed with slashes (/) used as separators. If the entire text cannot be displayed, “...” will be displayed.

- 3 Display the [Metadata] tab, and configure metadata output settings.

### [Metadata Output]

Select the check boxes of the metadata items you want to transfer to the external media. (Multiple selections can be made.)

You can select from [Recording Date], [Patient Info.], [Doctor], [Case], and [Facility Name].

None of the check boxes are selected under default settings.

#### Tips

- Metadata is saved to the uppermost directory of the recorded data folder.
- When [Patient Info.] is selected, the patient’s ID, name, gender, and date of birth will be output as metadata.

### [Metadata Format]

Displays the format of the metadata outputs.

### [Encryption]

Select whether to encrypt the metadata that is output. The default setting is [Not Used].

### [Key]

This item is available when [Encryption] is set to [Use].

Enter the encryption key using 32 hexadecimal digits.

#### Tip

When [CMS Mode] is set to [Use] in the [System Admin Settings] screen – [Function Settings] screen – [CMS] tab, the setting will be fixed at the current selection and cannot be changed.

- 4 To configure print settings, proceed to “*Configuring Print Settings*” (page 33).

If you are finished configuring settings, select [Apply] and press the ENTER button.

---

## Configuring Print Settings

Configure print settings for still images.

The unit supports connection and use of the Sony UP-DR80MD printer.

#### Tip

You can select the printer for use from the [System Admin Settings] screen – [Device Settings] screen – [Device 1] tab.

*For details on this setting, see “[Device 1] Tab” (page 62).*

- 1 Display the [Print 1] tab, and configure settings related to print methods and items to be printed.

The name of the currently connected printer appears in the [Printer] box.

#### [Layout]

Select the number of still images to print on each sheet.

For the portrait orientation

You can select from 1 image (1 × 1), 2 images (1 × 2), 4 images (2 × 2), 6 images (2 × 3), 8 images (2 × 4), 9 images (3 × 3), 12 images (3 × 4), 15 images (3 × 5), or 18 images (3 × 6).

The default setting is [6 images (2 × 3)].

For the landscape orientation

You can select from 1 image (1 × 1), 2 images (2 × 1), 4 images (2 × 2), 6 images (3 × 2), 8 images (4 × 2), 9 images (3 × 3), 12 images (4 × 3), 15 images (5 × 3), or 18 images (6 × 3).

The default setting is [6 images (3 × 2)].

#### [Auto Print]

Select whether to print automatically at the moment a still image is captured.

The default setting is [Not Used].

#### [Add. Info.]

Select the check boxes of the additional information items you want to print. (Multiple selections can be made.)

You can select from [Recording Date], [Patient Info.], [Doctor], [Case], [Recording Timestamp], [Logo], [Facility Name], and [Watermark].

None of the check boxes are selected under default settings.

#### [Watermark]

Select whether to print watermarks.

#### Tip

To print watermarks or logos, you must import watermark or logo files that were created in the proper format beforehand. You can import watermark or logo files from the [System Admin Settings] screen – [Device Settings] screen – [Device 1] tab.

*For details on importing, see “[Import Watermark]” (page 63) and “[Import Logo]” (page 63).*

- 2 Display the [Print 2] tab, and configure settings related to paper size and print quantity.

#### [Paper]

Select the printer’s paper size.

The default setting is [Letter].

#### [Orientation]

Select the orientation for printing.

The default setting is [Portrait].

#### [Copies]

Specify the number of copies to print (1 to 10).

The default setting is [1].

- 3 To configure screen display settings, proceed to “*Configuring Other Settings*” (page 34).

If you are finished configuring settings, select [Apply] and press the ENTER button.

---

## Configuring Other Settings

Configure settings related to the screen displays.

- 1 Display the [Other] tab, and configure the following settings.

#### [Menu Display]

Select 2D or 3D for the menu screen display format.

The default setting is [2D].

#### [Select Right/Left of Image]

Select which image (left or right) to use for 2D recorded data when recording still images or recording simultaneously.

The default setting is [Left].

- 2 When you finish configuration, select [Apply] and press the ENTER button.

The [Settings] screen appears again.

# Function Keys

When using the unit, you can assign certain functions (recording, playback, etc.) to the function keys (F1 to F12) at the top of a keyboard and perform these functions with a single keystroke.

We recommend assigning frequently used functions based on your working environment.

**Tip**

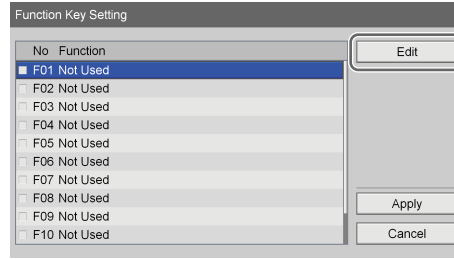
To perform controls for only Ch2 without the use of a touch panel monitor, the Ch2 controls must be assigned to function keys beforehand.

## Using Function Keys

**Tip**

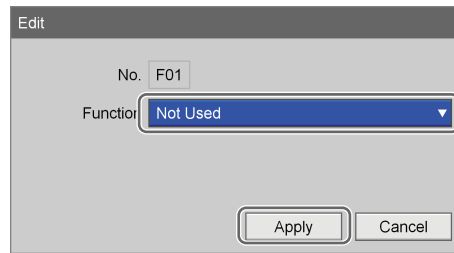
The function keys are enabled only when the hard keyboard mode is enabled.

- 1 Press the MENU button.  
The [MENU] screen appears.
- 2 Select [Settings], and press the ENTER button.  
The [Settings] screen appears.
- 3 Select [System Admin Settings], and press the ENTER button.  
The [System Admin Settings] screen appears.
- 4 Select [Device Settings], and press the ENTER button.  
The [Device Settings] screen appears.
- 5 Display the [Device 2] tab, and set [Keyboard Mode] to [Hard Keyboard].
- 6 Select [Advanced] for [Keyboard Mode], and press the ENTER button.  
The [Function Key Setting] screen appears.
- 7 Select the check boxes of the necessary function keys, select [Edit], and then press the ENTER button.



The [Edit] screen appears.

- 8 Select the functions to assign to the function keys under [Function], select [Apply], and then press the ENTER button.



The [Function Key Setting] screen appears again.

- 9 Select [Apply], and press the ENTER button.  
The [Function Key Setting] screen closes, and the [Device 2] tab appears again.

## Factory Assigned Functions

The following functions are assigned to the function keys under factory default conditions.

Function Keys	Function
F1	Rec Prep / New Folder
F2	Playback
F3	Fast forward
F4	Rewind
F5	Stop
F6	Pause
F7	Record
F8	Capture
F9	Call list
F10	Add to list
F11	Set Chapter
F12	Close Folder

**Tip**

The following functions operate as follows.

- [Rec Prep / New Folder]: Display the [Recording Preparation] screen. A new folder is created.

- [Record]: Record video and audio.
- [Set Chapter]: Insert a chapter separator without saving a still image of the recording.
- [Close Folder]: End the recording session.

---

## Other Assignable Functions

Aside from the factory assigned functions, the following functions can also be assigned to the function keys.

- [Audio Rec On]: Record audio.
- [Audio Rec Off]: Disable audio recording.
- [Menu Display]: Display the [MENU] screen.
- [Chapter Next]: Jump forward to the next chapter.
- [Chapter Back]: Jump back to the previous chapter.
- [1 GOP Next]: Jump forward to the next GOP.
- [1 GOP Back]: Jump back to the previous GOP.
- [Eject]: Eject the inserted disc.
- [Rec List Display]: Display the [Recording List] screen.
- [Status Display On]: Display the unit's operation status (i.e., recording, play, pause).
- [Status Display Off]: Hide the unit's operation status (i.e., recording, play, pause).
- [Test Record]: Perform a test recording.
- [Ch2 Rec]: Start Ch2 recording.
- [Ch2 Stop]: Stop Ch2 recording or playback.
- [Ch2 Play]: Play back Ch2 recorded data.
- [Ch2 Pause]: Pause Ch2 recording or playback.

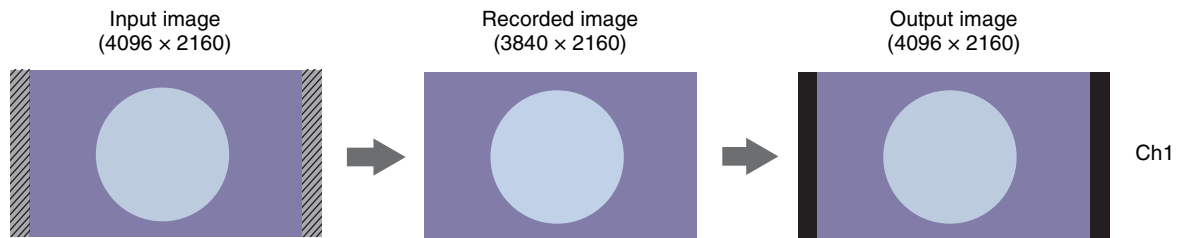
# 4K Convert Modes

The following image conversions are performed when [Cut] and [Downconvert] are selected for [4K Convert Mode]. You can configure the [4K Convert Mode] setting in the [User Settings] screen - [Recording] tab. For details on this setting, see “*Configuring Recording Settings*” (page 32).

## [Cut] mode

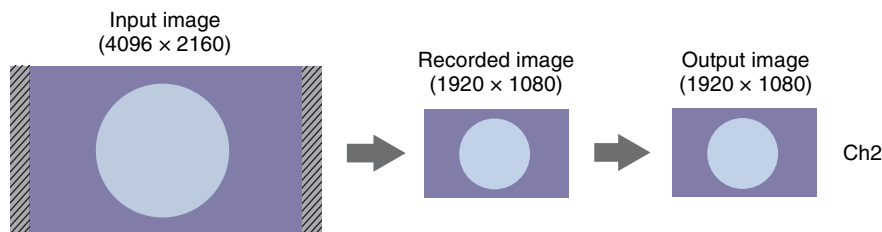
### 4K → 4K conversion

- The input image is recorded with 128 pixels cut on both the left and right sides (shaded area in illustration).
- The image is output with black bars (128 pixel width) added to the left and right.



### 4K → 2K conversion

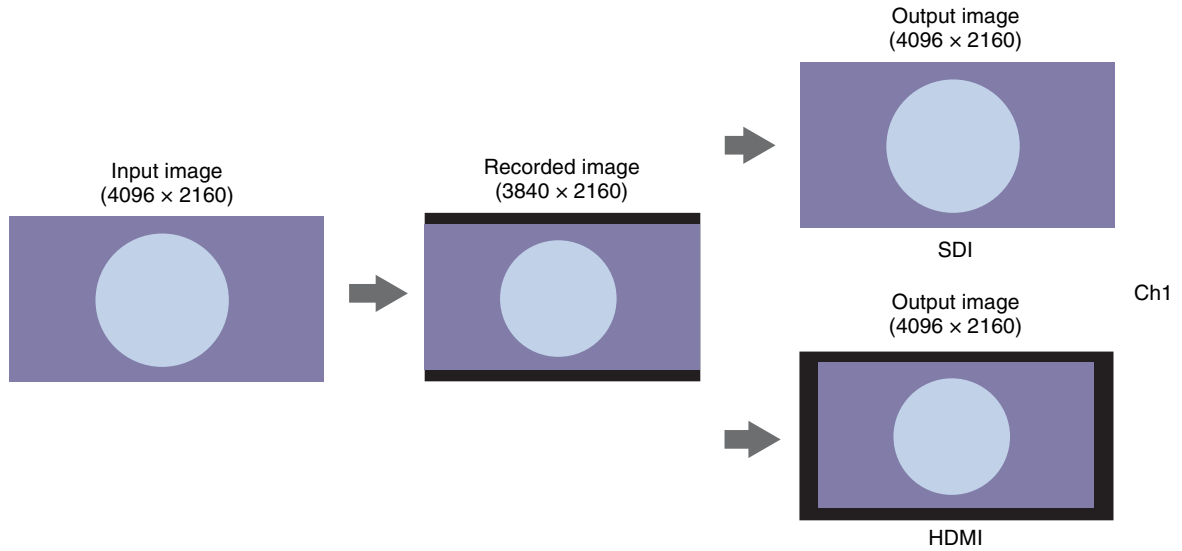
- The input image is recorded with 128 pixels cut on each of the left and right sides with its height and width reduced to 1/2 size.
- The recorded image is output as it is recorded.



## [Downconvert] mode

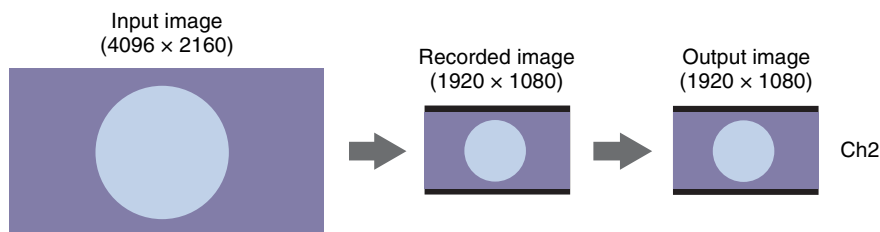
### 4K → 4K conversion

- The input image is recorded in reduced size with its original aspect ratio and black bars added to the top and bottom (67 and 68 pixel height respectively).
- For SDI outputs, the black bars are removed and the image is expanded to its original resolution.
- For HDMI outputs, black bars (128 pixel width) are added to the left and right of the recorded image.



### 4K → 2K conversion

- The input image is recorded with its height and width reduced to 1/2.1 size and black bars added to the top and bottom (33.5 and 34 pixel height respectively).
- The recorded image is output as it is recorded.

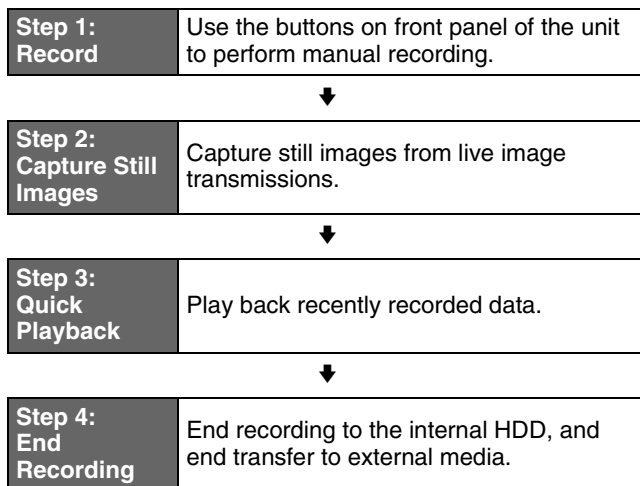


### Note

When using 3D input signals, [Cut] mode will be used regardless of the [4K Convert Mode] setting.

## Operation Flow

This chapter describes how to record and play back videos and capture still images while viewing the display on the front panel of the unit and using only the buttons on the front panel.



*For details on recording preparation, recording, and playback operations, see “Chapter 4 Recording and Playback” (page 43).*

### Overview of recorded data

“Recorded data” on this unit refers to the data recorded from the time a “new folder” is created (i.e., when recording is started) to the time “close folder” is performed. Recorded data entries include titles. A single recorded data entry can include multiple titles. A title is created whenever a stop operation is performed during recording.

Titles can consist of video data or captured still images. Up to 15,000 recorded data entries can be registered on the unit.

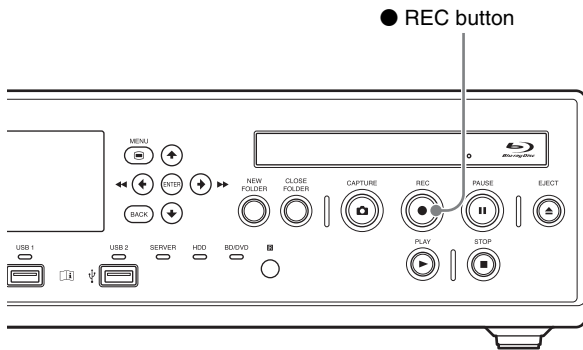
A single recorded data entry can include up to 255 titles.

### Tip

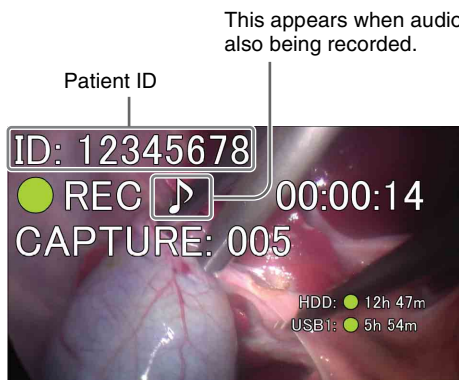
If an input signal is interrupted, a chapter separator will be inserted when it is restored. When saving to external media, files will be separated by chapters.

# Step 1: Record

1 Press the ● REC button.



Recording starts.  
“REC” appears while recording is in progress.

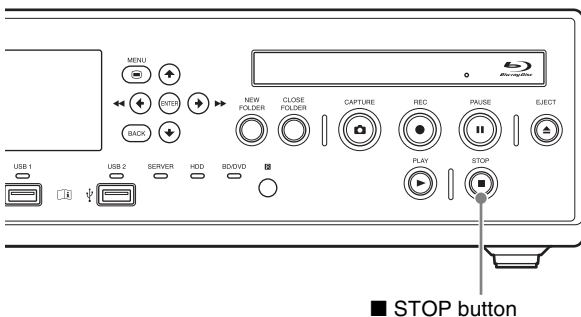


This appears when audio is also being recorded.

## Tip

If images are recorded and patient information has not been entered in the [Recording Preparation] screen, patient IDs will be automatically assigned. The letter “U” appears at the beginning of automatically assigned patient IDs.

2 Press the ■ STOP button to stop recording.



Recording stops, and “STOP” appears.

If the surgical procedure or examination is finished and you want to end the recording session, proceed to “Step 4: End Recording” (page 42) and perform the recording end procedure.

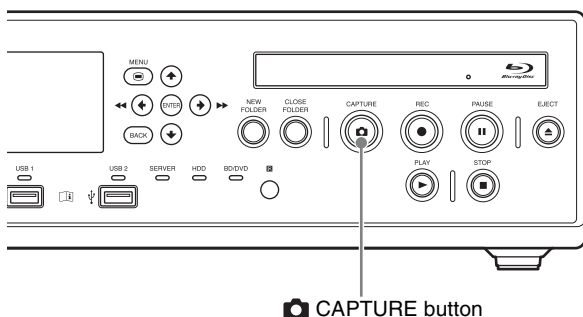
## Tip

If you press the ● REC button again, recording will start again as a new recorded data entry.

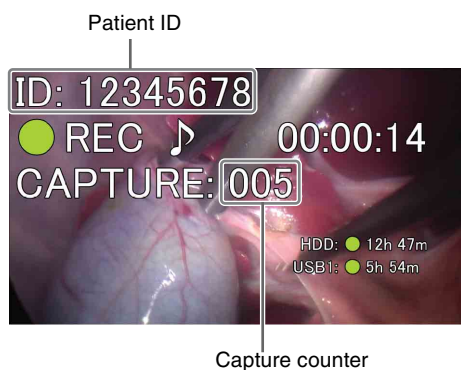
## Step 2: Capture Still Images

Capture still images from live image transmissions. Up to 500 still images can be captured for a single recorded data entry.

Press the  CAPTURE button.



When you capture an image, the capture number appears.



Capture counter

The still image data is saved.

For details on capturing still images, see “Capture Still Images” (page 47).

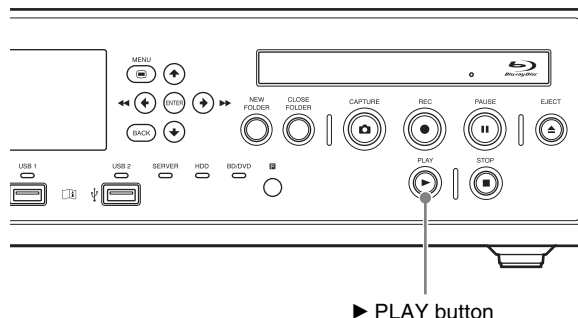
Recorded data entries are created when still images are captured.

If the surgical procedure or examination is finished and you want to end the recording session, proceed to “Step 4: End Recording” (page 42) and perform the recording end operation.

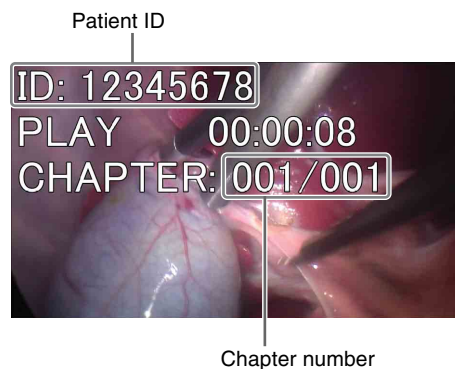
## Step 3: Quick Playback

Play back data recorded in Step 1.

Press the  PLAY button.



The most recent recorded data plays back. “PLAY” and the number of the chapter being played back appear while playback is in progress.



Chapter number

You can also perform the following operations during playback.

### Fast forward playback



Press the  FF button.

### Rewind playback

Press the  REW button.

### Pause playback

Press the  PAUSE button.

To resume playback, press the  PAUSE button again or press the  PLAY button.

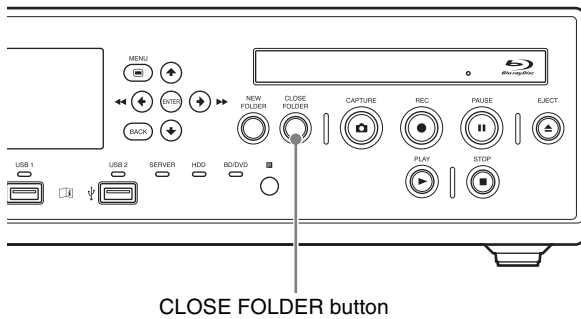
### Stop playback

Press the  STOP button.

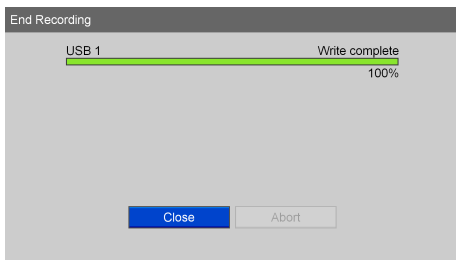
# Step 4: End Recording

End the recording session to stop recording to the internal HDD and stop transfer to external media. This operation is referred to as “closing a folder.”

- 1 Press the **■ STOP** button to stop recording.
- 2 Press the **CLOSE FOLDER** button.



Select [OK] when the confirmation message appears, and press the ENTER button to display the [End Recording] screen.



- 3 When the writing process is complete, select [Close] and press the ENTER button.  
The [MENU] screen appears again.

## Recording Preparation

Before starting to record, enter information regarding the patient of the surgical procedure or examination, configure the storage destination and quality settings for recorded data, and then perform a test recording. You can also register information for multiple patients in advance, and simply recall the corresponding patient information on the day of the procedure or examination. You can prepare for recording and test record in the [Recording Preparation] screen.

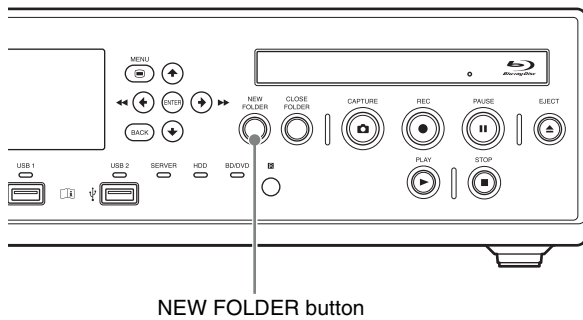
### Patient Information and Data Storage Settings

Enter information regarding the patient of the surgical procedure or examination, and configure the storage destination and quality settings for recorded data. Use the on-screen keyboard to enter text.

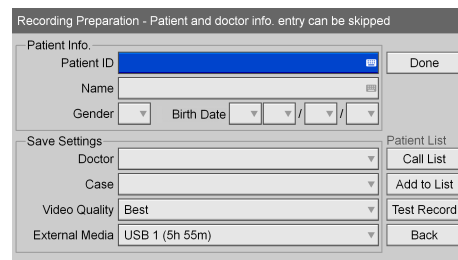
For details on use, see “Using the On-Screen Keyboard (Text Entry)” (page 26).

**1** Press the NEW FOLDER button.

Alternatively, select [Recording Preparation] in the [MENU] screen, and press the ENTER button.



The [Recording Preparation] screen appears.



**2** Enter patient information.

Patient information entry can be skipped.

#### [Patient ID]

Enter an identification number for the patient.

#### Tip

Certain symbols (¥ / : ? \* " < > | . \) cannot be used for the patient ID.

#### [Name]

Enter up to 64 characters in each field of the patient's name.

For details on the input fields for the patient name, see “[Patient Name Field]” (page 59).

#### [Gender]

Select the gender of the patient. You can select from [Male], [Female], or [Unknown], or leave the field empty.

#### [Birth Date]

Select the year, month, and day.

**3** Configure storage settings for recorded data.

#### [Doctor]

Select the name of the doctor performing the surgical procedure or examination. This item can be skipped.

#### Tip

You can register doctors in the [System Admin Settings] screen – [Edit Doctor List] screen.

For details on this setting, see “Doctor List Registration” (page 69).

**[Case]**

Select the case.

**Tip**

The cases must be registered beforehand.

For details on this setting, see “Registering Cases” (page 71).

**[Video Quality]**

Select the video image quality.

You can select from [Best], [High], and [Standard]. This setting applies to both Ch1 and Ch2.

**Tip**

You can configure a default setting for this item in the [User Settings] screen – [Quality] tab.

For details on this setting, see “Configuring Image Quality Settings” (page 31).

**[External Media]**

When you want to simultaneously save to external media in addition to saving to the unit’s internal hard disk, configure these settings to specify the storage destination for recorded data.

If you do not want to simultaneously record to external media, select [Not Used].

If you want the unit to detect the inserted media automatically, select [Auto].

**Tips**

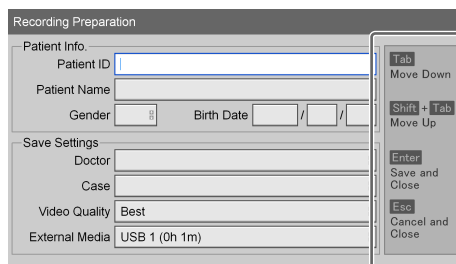
- If the external media is currently inserted and recognized, the remaining recording times are also displayed.
- Servers will not be automatically recognized.
- When auto recognition is enabled and multiple media are inserted, data will be recorded to the media in the following order of priority: USB1 → BD/DVD → USB2.
- You cannot change media types in the middle of recording when auto recognition is enabled.
- Recorded data for Ch2 will be recorded to the same external media specified for Ch1.
- When [CMS Mode] is set to [Use] in the [System Admin Settings] screen – [Function Settings] screen – [CMS] tab, the setting will be fixed at its current setting.

**4** To perform a test recording, proceed to “Test Recording” (page 45).

If you are finished configuring settings, select [Done] and press the ENTER button.

## Using a Hard Keyboard for Patient Information and Data Storage Settings

When [Keyboard Mode] is set to [Hard Keyboard] in the [System Admin Settings] screen – [Device Settings] screen, you can configure patient information and data storage settings using only the connected keyboard. When hard keyboard mode is enabled, a guide appears on the right side of the screen and the following keys function as follows.



Key	Function
Tab	Move to the next input field.
Shift + Tab	Move to the previous input field.
↑ ↓ (arrows)	Select items.
← → (arrows)	Move within entered text.
Enter	Apply the setting, and close the [Recording Preparation] screen.
Esc	Cancel the setting, and close the [Recording Preparation] screen.

## Registering Multiple Patients in Advance

You can register information for multiple patients of procedures and examinations in advance. By doing so, you can simply select the patient from the registered patient list on the day of the procedure or examination and save time on preparation.

### To register patients

Register patients for procedures and examinations to the patient list.

- 1** Configure patient information and storage settings for recorded data in the [Recording Preparation] screen, select [Add to List], and then press the ENTER button.

For details on patient information and save settings for recorded data, see “Patient Information and Data Storage Settings” (page 43).

The patient is added to the patient list.

- 2 Repeat to add any additional patients as necessary.

#### Tip

You can register up to 100 patients to the patient list. When you exceed 100, existing patients will be overwritten automatically starting with the oldest.

### To recall patients

Recall patients that have been registered in advance.

- 1 Select [Call List] in the [Recording Preparation] screen, and press the ENTER button.  
The [Patient List] screen appears.
- 2 Select the target patient, and press the ENTER button to select its check box.
- 3 Select [Execute], and press the ENTER button.  
The [Recording Preparation] screen appears again, and the patient information will be applied in the [Recording Preparation] screen.

### To edit registered patient settings

Edit patient information and save settings for recorded data that were registered in advance.

- 1 Select [Call List] in the [Recording Preparation] screen, and press the ENTER button.  
The [Patient List] screen appears.
- 2 Select the patient for which you want to edit settings, and press the ENTER button to select its check box.
- 3 Select [Change], and press the ENTER button.  
The [Change Patient List] screen appears.
- 4 When you finish editing settings, select [Apply] and press the ENTER button.  
The [Patient List] screen appears again.
- 5 Select [Execute], and press the ENTER button.  
The [Recording Preparation] screen appears again.

### To delete registered patients from the list

Delete patients that were registered in advance from the list.

- 1 Select [Call List] in the [Recording Preparation] screen, and press the ENTER button.  
The [Patient List] screen appears.
- 2 Select the patient to delete, and press the ENTER button to select its check box.
- 3 Select [Delete], and press the ENTER button.
- 4 Select [OK] when the confirmation message appears, and press the ENTER button.  
The patient entry is deleted.
- 5 Select [Back], and press the ENTER button.  
The [Recording Preparation] screen appears again.

---

## Test Recording

Confirm whether images record properly. When you perform a test recording, images record for 5 seconds and then play back automatically.

- 1 Select [Test Record] in the [Recording Preparation] screen, and press the ENTER button.
- 2 Select [OK] when the confirmation message appears, and press the ENTER button.  
Recording starts, and a message indicating that test recording is in progress appears throughout the process.  
After 5 seconds of recording, playback starts automatically.  
When test recording is finished, the [Recording Preparation] screen appears again.
- 3 Select [Done], and press the ENTER button.  
The [MENU] screen appears again.

---

# Recording

Images can be recorded manually or via contact switch. This section describes how to record manually.

*For details on configuring patient information and storage destinations for recorded data beforehand, see “Recording Preparation” (page 43).*

## Tip

For details on how to record via contact switch, contact your local Sony representative.

## Note on the auto delete function for recorded data

Whenever the remaining capacity on the unit’s internal hard disk becomes low, an auto delete function automatically deletes recorded data, starting with the oldest start dates for recording. This is done to maintain free space on the unit’s internal hard disk at all times. To disable the auto delete function, set [Auto Delete] to [Not Used] in the [System Admin Settings] screen.

---

## Manual Recording

**1** Press the ● REC button.

Recording starts.  
“REC” appears on the front panel display while recording is in progress.

**2** Press the ■ STOP button to stop recording.

**3** To end the surgical procedure or examination recording session, press the CLOSE FOLDER button.

A confirmation message for ending recording appears.

**4** Select [OK], and press the ENTER button.

The [End Recording] screen appears, and the status of data transfer to external media, for example, appears. Wait a moment for the writing process to complete.

**5** When the writing process is complete, select [Close] and press the ENTER button.

To cancel transfer to external media, select [Abort] and press the ENTER button.

The [MENU] screen appears again.

## Tip

You can record up to 24 continuous hours from the moment you start recording or capture a still image. After 24 hours, recording will stop automatically, and the “close folder” is performed.

## Recorded data directory

Video data is stored in one of the following directories, depending on the system administrator settings.

### Video data directory

<uppermost folder of the external media>/<recording start date (year, month, day, hour, minute, second)\_patient ID>/MOVIE/

or

<uppermost folder of the external media>/<patient ID>/<recording start date (year, month, day, hour, minute, second)>/MOVIE/

## Tips

- The order of the year, month, and day of the recording date used in the storage directory is based on the date format of the system settings.
- If the power supply is disconnected before the writing of the data is complete, the validity of the written data cannot be guaranteed.
- When recording to external media, the media can be switched out up to 15 times for a single recorded data entry. When this limit is exceeded, the “Exch. media limit exceeded” message appears on the [End Recording] screen.
- If you press the ● REC button again, recording will start again as a new title for the same patient.

---

# Capture Still Images


You can capture a particular shot during a live transmission, and store it as a still image file. Still images can be captured manually or via contact switch. This section describes manual operations.

## Tip

For details on contact switch controls, contact your local Sony representative.

---

## Manual Still Image Capture

To capture a still image, press the  CAPTURE button at the moment you want to capture the still image. A chapter separator is also created at the position in which the still image was captured. Recorded data entries are created when still images are captured. If the surgical procedure or examination is finished and you want to end the recording session, perform the recording end procedure.

*For details on use, see “Step 4: End Recording” (page 42).*

## Tip

You can configure format setting for still images files in the [User Settings] screen – [Quality] tab.

*For details on this setting, see “Configuring Image Quality Settings” (page 31).*

## Still image data directory

Still image data is stored in one of the following directories, depending on the system administrator settings.

### Still image directory

<uppermost folder of the external media>/<recording start date (year, month, day, hour, minute, second)\_patient ID>/STILL/  
or  
<uppermost folder of the external media>/<patient ID\_recording start date (year, month, day, hour, minute, second)>/STILL/

## Tip

The order of the year, month, and day of the recording date used in the storage directory is based on the date format of the system settings.

---

# Using the Ch1/Ch2 Simultaneous Recording Function

This function allows automatic Ch2 recording (2K) during Ch1 recording (4K).

## Tip

In Ch1/Ch2 simultaneous recording mode, the 4K signals input to Ch2 are downconverted to 2K 1920×1080 format and recorded while Ch1 recording (4K) is in progress.

---

## Configuring Settings for Ch1/Ch2 Simultaneous Recording

Configure the following settings in the [User Settings] screen - [Recording] tab.

### [Ch1/Ch2 Rec Mode]

Select [Ch1/Ch2 Simul Rec].

### [Ch2 Rec Format]

Select 2D or 3D.

*For details on the [Recording] tab, see “Configuring Recording Settings” (page 32).*

## Tip

When using 2D input signals, 2D mode will be used regardless of the [Ch2 Rec Format] setting.

---

## Performing Ch1/Ch2 Simultaneous Recording

Operations for Ch1/Ch2 simultaneous recording are identical to those for Ch1 recording.

When you press the ● REC button, recording for Ch1 starts and triggers recording for Ch2 to start.

---

# Playback

You can play back the most recent recorded data stored on the unit's internal hard disk via simple controls.

*You can also play back recorded data from search results. For details, see “Image Search” (page 49).*

---

## Playing Back the Most Recent Data (Quick Playback)

Press the ► PLAY button to play back the most recently recorded data on the internal hard disk.

## Tip

Ch1 recorded video data is played back with quick playback. Recorded data that does not include Ch1 video will not be played back.

## Playback operations

You can use the buttons on the front panel of the unit to perform the following playback operations.

### Fast forward playback

Press the ►► FF button.

## Tip

Depending on the structure of the data, fast forward playback may not be possible for the entire recording.

### Rewind playback

Press the ◀◀ REW button.

### Pause playback

Press the ■ PAUSE button.

To resume playback, press the ■ PAUSE button again or press the ► PLAY button.

### Stop playback

Press the ■ STOP button.

## Tips

- If you press the MENU button during playback, playback will stop.
- When NTSC is selected as the video format under the system administrator settings, PAL-format recorded data cannot be played back properly. Conversely, when PAL is selected, NTSC-format recorded data cannot be played back properly.

---

# Image Search

You can search for recorded data stored on the unit's internal hard disk.

Use the on-screen keyboard to enter text.

For details on use, see "Using the On-Screen Keyboard (Text Entry)" (page 26).

---

## Specifying Search Conditions

Search for recorded data by specifying conditions such as patient ID and recording date.

- 1 Press the MENU button.  
The [MENU] screen appears.
- 2 Select [Recording List], and press the ENTER button.  
The [Recording List] screen appears.
- 3 Select [Search], and press the ENTER button.  
The [Search] screen appears.
- 4 Specify the search conditions, select [Search], and press the ENTER button.

### [Patient ID]

Enter an identification number for the patient.

### [Patient Name]

Enter the patient's name.

### [Doctor]

Select the name of the doctor performing the surgical procedure or examination.

### [Recording Date]

Select the year (last two digits), month, and day.

### [Status]

Select whether the recorded data has been saved to external media.

You can select from [Saved to Media], [Not Saved to Media], or [DICOM Unsent], or leave the field empty.

### Tip

The [DICOM Unsent] setting appears only if [DICOM] is set to [Use] in the [System Admin Settings] screen – [DICOM Settings] screen – [Server] tab.

### [2D/3D]

Select whether the recorded data is 2D data or 3D data.

### Tip








Select [Clear] and press the ENTER button to clear all specified search conditions.

- 5 Select [Search], and press the ENTER button.

A search for recorded data matching the specified conditions is performed, and the results are displayed.

## Status of recorded data

The following icons appear based on the status of the recorded data.

Status	Description	Icon
Not saved to external media	The recorded data has not been saved to external media. The icon disappears when saving is completed.	
Protected	The recorded data is protected and cannot be deleted. The icon disappears when the protection is released.	
DICOM transfer failed	DICOM transfer failed. The icon disappears when transfer is successful.	
3D data	The data was recorded in 3D mode.	
2D data	The data was recorded in 2D mode.	
4K data	The recorded data is in 4K format.	
2K data	The recorded data is in 2K format.	

---

## Viewing Thumbnails of Recorded Data

You can view thumbnail images of recorded data in an image list.

- 1 Select [Image List] for the operation box in the [Recording List] screen.
- 2 Select the recorded data in the [Recording List] screen, and press the ENTER button.

The [Image List] screen appears, and thumbnail images of the recorded data are displayed.



- 3 To change the type of images for which to display thumbnails, select the [Display] box and press the ENTER button.

The [Display] screen appears.

- 4 Select [Video], [Still], or [All], and press the ENTER button.

The display changes.

### Tips

- If [Video] is selected, the thumbnails are displayed by title or by chapter, depending on the [Image List Display] setting in the [System Admin Settings] screen – [Function Settings] screen – [General 1] tab.
- You can also select recorded data for printing or copying to external media in the thumbnail display screen.

For details, see “Processing Recorded Data” (page 51).

## Playback from the Search Results List

- 1 Select [Image List] for the operation box in the [Recording List] screen.
- 2 To play back a title, select the recorded data you want to play back in the [Recording List] screen (search results list), and press the ► PLAY button.
- 3 To play back by chapter, select the recorded data you want to play back, and press the ENTER button.

The [Image List] screen appears, and thumbnail images of the recorded data are displayed.

### Tip

To display recorded data by chapter, set [Image List Display] to [Chapter] in the [System Admin Settings] screen – [Function Settings] screen.

- 4 Select the recorded data you want to play back, and press the ► PLAY button.

The recorded data that is highlighted plays back.

### Tip

Only the highlighted recorded data is played back.

## Sorting the Recorded Data List

You can sort the recorded data list by recording date, patient ID, patient name, size, or save status.

### Tip

The sizes displayed in the [Recording List] screen indicate total sizes for Ch1 and Ch2.

- 1 Select [Sort] in the [Recording List] screen, and press the ENTER button.  
The [Sort] screen appears.
- 2 Select the [Item] box, and press the ENTER button.  
The [Item] screen appears.
- 3 Select the category by which to sort, and press the ENTER button.  
The [Sort] screen appears again.
- 4 Select the [Order] box, and press the ENTER button.  
The [Order] screen appears.
- 5 Select [Descending] or [Ascending], and press the ENTER button.

Depending on the selected category, the descending and ascending orders are as follows.

Category	Descending	Ascending
[Recording Date]	Start with newest	Start with oldest
[Patient ID]	Alphabetical order → numerical order	Reverse numerical order → reverse alphabetical order
[Patient Name]	Alphabetical order → numerical order	Reverse numerical order → reverse alphabetical order
[Status]	[Not Saved to Media] → [Saved to Media]	[Saved to Media] → [Not Saved to Media]
[Size]	Start with largest	Start with smallest

The [Sort] screen appears again.

- 6 Select [Execute], and press the ENTER button.

The recorded data is sorted according to the specified order.

---

## Processing Recorded Data

You can process recorded data stored on the unit's internal hard disk in the following ways.

- Printing (*page 51*)
- Copying to External Media (*page 52*)
- Editing Patient Information (*page 53*)
- Protecting Recorded Data (*page 54*)
- Deleting Recorded Data (*page 54*)
- Viewing Information on Recorded Data (*page 54*)

---

### Printing

You can select still images for printing from the [Recording List] screen.

#### Tip

For details on configuring the number of images to print on each sheet and other print settings, see “*Configuring Print Settings*” (*page 33*).

- 1 Select [Image List] for the operation box in the [Recording List] screen.
- 2 Select the recorded data in the [Recording List] screen, and press the ENTER button.

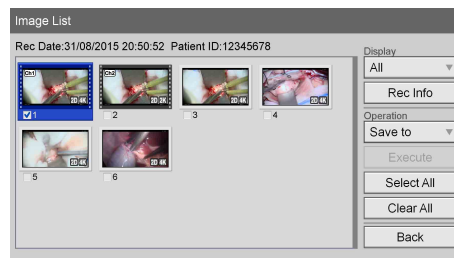
*For details on displaying the [Recording List] screen, see “Image Search” (page 49).*

The [Image List] screen appears.

- 3 If thumbnail images of video data are displayed, switch to still image display.

*For details on switching the display, see “Viewing Thumbnails of Recorded Data” (page 49).*

- 4 Select the check boxes for the recorded data you want to print.



- 5 Select the [Operation] box, and press the ENTER button.

The [Operation] screen appears.

- 6 Select [Print], and press the ENTER button.

The [Image List] screen appears again.

- 7 Select [Execute], and press the ENTER button.

The [Print] screen appears.

- 8 Change the settings as necessary.

If necessary, you can enter a comment of up to 60 characters to be printed with the images.

*For details on other settings, see “Configuring Print Settings” (page 33).*

Printing starts.

The remaining amount of paper is displayed during printing.

#### Tip

To cancel printing, select [Abort] and press the ENTER button.

- 9 When printing is complete, press the ENTER button while [Close] is selected.

The [Image List] screen appears again.

---

## Copying to External Media

You can copy recorded data stored on the unit’s internal hard disk onto a BD/DVD disc, USB memory device, or server.

Recorded data can be copied from the [Recording List] screen or [Image List] (thumbnail display) screen.

### To select data for copying from the [Recording List] screen

This section describes how to select recorded data for copying onto external media in the [Recording List] screen. You can select whether to copy videos, still images, or both with this procedure.

#### Tips

- If the power supply is disconnected before the writing of the data is complete, the validity of the written data cannot be guaranteed.
- When recording to external media, the media can be switched out up to 15 times for a single recorded data

entry. When this limit is exceeded, the “Exch. media limit exceeded” message appears on the [Save to] screen.

- 1 If you are copying to a BD/DVD disc or USB memory device, insert the media into the unit.

- 2 Display the [Recording List] screen, select the operation box, and press the ENTER button.

*For details on displaying the [Recording List] screen, see “Image Search” (page 49).*

The [Operation] screen appears.

- 3 Select [Save to], and press the ENTER button.

The [Recording List] screen appears again.

- 4 Select the check boxes for the recorded data you want to copy.

- 5 Select [Execute], and press the ENTER button.

The [Save to] screen appears.

- 6 Configure save settings for the recorded data, select [Execute], and press the ENTER button.

#### [External Media]

Select the storage destination.

You can select from [BD/DVD], [USB 1], [USB 2], and [SERVER].

#### [File Server]

If [SERVER] is selected as the external storage destination, select a file server (the server configured for each doctor).

#### [Save Video]

This is enabled when recorded video data is selected. Select the format of the recorded data you want to save.

You can select from [Ch1 2D], [Ch1 3D], [Ch2 2D], and [Ch2 3D]. (Multiple selections can be made.)

All of the check boxes are selected under default settings.

#### [Save Still]

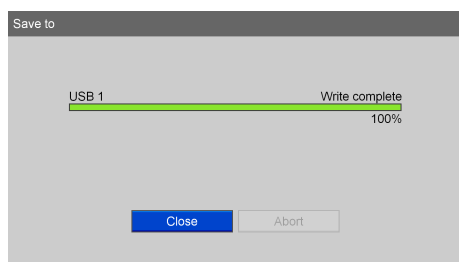
Select the check boxes of the storage formats for 3D still images.

You can select from [3D], [2D], [Convert to 2D DICOM], [2D Left], [Convert to 2D DICOM Left], [2D Right], and [Convert to 2D DICOM Right]. (Multiple selections can be made.)

When “convert to DICOM” is selected, the specified still image format is converted to DICOM before saving.

All of the check boxes are selected under default settings.

Copying of recorded data starts.



#### Tip

To cancel copying, select [Abort] and press the ENTER button.

- 7 When copying is complete, press the ENTER button while [Close] is selected.

The [Recording List] screen appears again.

### To select data for copying from the [Image List] (thumbnail display) screen

This section describes how to select thumbnail images of recorded data in the [Image List] screen for copying onto external media. The copying procedure is identical for both videos and still images.

- 1 If you are copying to a BD/DVD disc or USB memory device, insert the media into the unit.
- 2 Select [Image List] for the operation box in the [Recording List] screen.

*For details on displaying the [Recording List] screen, see “Image Search” (page 49).*

- 3 Select the recorded data in the [Recording List] screen, and press the ENTER button.

The [Image List] screen appears.

- 4 Switch to the thumbnail display for videos when you want to copy video data, and switch to the thumbnail display for still images when you want to copy still image data.

*For details on switching the display, see “Viewing Thumbnails of Recorded Data” (page 49).*

- 5 Select the check boxes for the recorded data you want to copy.
- 6 Select the operation box, and press the ENTER button.

The [Operation] screen appears.

- 7 Select [Save to], and press the ENTER button.

The [Image List] screen appears again.

- 8 Select [Execute], and press the ENTER button.

The [Save to] screen appears.

- 9 Configure save settings for the recorded data, select [Execute], and press the ENTER button.

*For details on each setting, see step 6 of “To select data for copying from the [Recording List] screen” (page 52).*

#### Tip

To cancel copying, select [Abort] and press the ENTER button.

- 10 When copying is complete, press the ENTER button while [Close] is selected.

The [Image List] screen appears again.

---

## Editing Patient Information

You can edit the ID, name, and other patient information that is attached to recorded data and not yet configured.

#### Note

When [Change Patient Info.] is set [Not Used] in the [System Admin Settings] screen – [Function Settings] screen – [Patient Info.] tab, you can only edit patient information that has not yet been entered. Patient information entered by a user cannot be edited.

- 1 Display the [Recording List] screen, select the operation box, and press the ENTER button.

The [Operation] screen appears.

- 2 Select [Change], and press the ENTER button.

The [Recording List] screen appears again.

- 3 Select the check box of the recorded data for which you want to edit patient information.

#### Tip

You can only edit patient information for one recorded data entry at a time. If multiple recorded data entries are selected, patient information editing will be disabled.

- 4 Select [Execute], and press the ENTER button.

The [Change] screen appears.

- 5 Edit each item as necessary, select [Change], and press the ENTER button.

For details on each setting, see “Patient Information and Data Storage Settings” (page 43).

The patient information is changed, and the [Recording List] screen appears again.

---

## Protecting Recorded Data

You can protect data to prevent accidental deletion. Recorded data can be protected or protection can be removed from the [Recording List] screen.

### To select data for protection from the [Recording List] screen

This section describes how to select recorded data for protection in the [Recording List] screen. Both videos and still images will be protected with this procedure.

- 1 Display the [Recording List] screen, select the operation box, and press the ENTER button.

For details on displaying the [Recording List] screen, see “Image Search” (page 49).


The [Operation] screen appears.

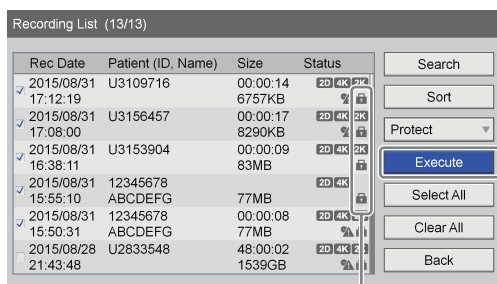
- 2 Select [Protect], and press the ENTER button.







The [Recording List] screen appears again.

- 3 Select the check boxes for the recorded data you want to protect.

- 4 Select [Execute], and press the ENTER button.

The recorded data is protected, and the  icon appears.



Rec Date	Patient (ID, Name)	Size	Status
2015/08/31 17:12:19	U3109716	00:00:14 6757KB	
2015/08/31 17:08:00	U3156457	00:00:17 8290KB	
2015/08/31 16:38:11	U3153904	00:00:09 83MB	
2015/08/31 15:55:10	12345678 ABCDEFG	00:00:08 77MB	
2015/08/31 15:50:31	12345678 ABCDEFG	00:00:08 77MB	
2015/08/28 21:43:48	U2833548	48:00:02 1539GB	

The  icon appears for recorded data that is protected.

### To remove protection

Select [UnProtect] in step 2 of the previous procedure, and press the ENTER button. Perform the rest of the procedure as shown.

---

## Deleting Recorded Data

You can delete recorded data stored on the unit’s internal hard disk for particular surgical procedures or examinations.

Recorded data can be deleted from the [Recording List] screen.

### Note

Recorded data that is deleted cannot be restored.

- 1 Display the [Recording List] screen, select the operation box, and press the ENTER button.

For details on displaying the [Recording List] screen, see “Image Search” (page 49).

The [Operation] screen appears.

- 2 Select [Delete], and press the ENTER button.

The [Recording List] screen appears again.

- 3 Select the check boxes for the recorded data you want to delete.

- 4 Select [Execute], and press the ENTER button.

- 5 Select [OK] when the confirmation message appears, and press the ENTER button.

When deletion of the recorded data is complete, a notification message will appear.

To return to the [Recording List] screen, press the ENTER button.

---

## Viewing Information on Recorded Data

You can view information on recorded data stored on the unit’s internal hard disk.

- 1 Select [Image List] for the operation box in the [Recording List] screen.

- 2 Select the check box of the recorded data entry you want to view in the [Recording List] screen, and press the ENTER button.

*For details on displaying the [Recording List] screen, see “Image Search” (page 49).*

The [Image List] screen appears.

- 3** Select [Rec Info], and press the ENTER button.

The information on the recorded data is displayed.

**Tip**

The sizes displayed in the [Recording List] screen indicate total sizes for Ch1 and Ch2.

## Displaying the [System Admin Settings] Screen

You can set the initial configurations for various settings in the [System Admin Settings] screen.

Configurations in the [System Admin Settings] screen must be performed by the system administrator.

- Language and Time Settings (page 57)  
Configure the display language and the date and time settings.
- Function Settings (page 59)  
Configure initial settings for recording and general functions.
- Device Settings (page 62)  
Configure initial settings for connected external devices.
- Password Settings (page 66)  
Register or edit the password for the system administrator settings.
- Network Settings (page 67)  
Configure initial settings for the network and server.
- Doctor List Registration (page 69)  
Register and edit information regarding the doctors performing the surgical procedures and examinations.
- Editing Cases (page 71)  
Register or edit entries for surgical procedures and examinations.
- Auto Delete Settings (page 73)  
Configure settings for the auto delete function.
- DICOM Settings (page 74)  
Configure DICOM settings.

Use the on-screen keyboard to enter text.

For details on use, see “Using the On-Screen Keyboard (Text Entry)” (page 26).

- 1 Press the MENU button.

The [MENU] screen appears.

- 2 Select [Settings], and press the ENTER button.

The [Settings] screen appears.

- 3 Select [System Admin Settings], and press the ENTER button.

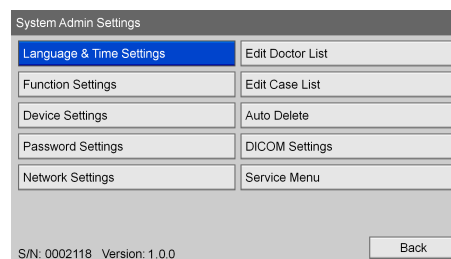
### Tip

If password protection is enabled, a password entry screen will appear.

- 4 Press the ENTER button when the system administrator settings notification screen appears.

The [System Admin Settings] screen appears

- 5 Select the settings you want to configure, and press the ENTER button.



The setting screen for the selected item appears. The serial number of the unit and the current software version appear at the bottom left.

### About the [Service Menu]

The [Service Menu] is a function reserved for service personnel.

It cannot be used by general users.

# Language and Time Settings

Configure the display language and the display format for the current date and time.

- 1 Select [Language & Time Settings] in the [System Admin Settings] screen, and press the ENTER button.

The [Language & Time Settings] screen appears.

- 2 Configure each setting in the [Language] tab.

## [Language]

Select the language for screen displays.

You can select from [English], [日本語] (Japanese), [Deutsch] (German), [Francais] (French), [Italiano] (Italian), and [Español] (Spanish).

## [Time Zone]

Select the time zone.

Only the difference from GMT (Greenwich Mean Time) is displayed for each time zone setting.

*For details on time zones, see “List of time zones” (page 57).*

## [Use Daylight Saving Time]

Select whether to enable DST (daylight saving time).

The default setting is [Not Used].

- 3 Configure each setting in the [Date & Time] tab.

## [Date Format]

Select the year, month, and day display format.

You can select from [YYYY/MM/DD] (year/month/day), [MM/DD/YYYY] (month/day/year), and [DD/MM/YYYY] (day/month/year).

The default setting is [MM/DD/YYYY].

## [Date]

Configure the current date.

## [Time]

Configure the current time.

- 4 When you finish configuration, select [Apply] and press the ENTER button.

The configurations are saved, and the [System Admin Settings] screen appears again.

## List of time zones

Time zone		DST
UTC-12:00	International Date Line West	
UTC-11:00	Coordinated Universal Time-11	
UTC-10:00	Hawaii	
UTC-09:00	Alaska	○
UTC-08:00	Baja California	○
UTC-08:00	Pacific Time (US and Canada)	○
UTC-07:00	Arizona	
UTC-07:00	Chihuahua, La Paz, Mazatlan	○
UTC-07:00	Mountain Time (US and Canada)	○
UTC-06:00	Guadalajara, Mexico City, Monterrey	○
UTC-06:00	Saskatchewan	
UTC-06:00	Central America	
UTC-06:00	Central Time (US and Canada)	○
UTC-05:00	Indiana (East)	
UTC-05:00	Bogota, Lima, Quito, Rio Branco	
UTC-05:00	Eastern Time (US and Canada)	○
UTC-04:30	Caracas	
UTC-04:00	Asuncion	○
UTC-04:00	Cuiaba	○
UTC-04:00	Santiago	
UTC-04:00	Georgetown, La Paz, Manaus, San Juan	
UTC-04:00	Atlantic Time (Canada)	○
UTC-03:30	Newfoundland	○
UTC-03:00	Cayenne, Fortaleza	
UTC-03:00	Greenland	○
UTC-03:00	Salvador	
UTC-03:00	Buenos Aires	○
UTC-03:00	Brasilia	○
UTC-03:00	Montevideo	○
UTC-02:00	Coordinated Universal Time-02	○
UTC-01:00	Azores	○
UTC-01:00	Cape Verde Is.	
UTC	Casablanca	
UTC	Dublin, Edinburgh, Lisbon, London	○
UTC	Monrovia, Reykjavik	
UTC	Coordinated Universal Time	
UTC+01:00	Amsterdam, Berlin, Bern, Rome, Stockholm, Vienna	○
UTC+01:00	Windhoek	○
UTC+01:00	Sarajevo, Skopje, Warsaw, Zagreb	○
UTC+01:00	Brussels, Copenhagen, Madrid, Paris	○

Time zone		DST
UTC+01:00	Belgrade, Bratislava, Budapest, Ljubljana, Prague	○
UTC+01:00	West Central Africa	
UTC+02:00	Athens, Bucharest	○
UTC+02:00	Amman	○
UTC+02:00	Istanbul	○
UTC+02:00	Jerusalem	○
UTC+02:00	Cairo	○
UTC+02:00	Kaliningrad (RTZ 1)	
UTC+02:00	Damascus	○
UTC+02:00	Tripoli	
UTC+02:00	Harare, Pretoria	
UTC+02:00	Beirut	○
UTC+02:00	Helsinki, Kiev, Riga, Skopje, Sofia, Tallinn, Vilnius	○
UTC+02:00	Eastern Europe	○
UTC+03:00	Kuwait, Riyadh	
UTC+03:00	Nairobi	
UTC+03:00	Baghdad	
UTC+03:00	Minsk	
UTC+03:00	Moscow, St. Petersburg, Volgograd (RTZ 2)	○
UTC+03:30	Tehran	○
UTC+04:00	Abu Dhabi, Muscat	
UTC+04:00	Izhevsk, Samara (RTZ 3)	
UTC+04:00	Yerevan	○
UTC+04:00	Tblisi	
UTC+04:00	Baku	○
UTC+04:00	Port Louis	○
UTC+04:30	Kabul	
UTC+05:00	Ashgabat, Tashkent	
UTC+05:00	Islamabad, Karachi	○
UTC+05:00	Yekaterinburg (RTZ 4)	
UTC+05:30	Sri Jayawardenepura	
UTC+05:30	Chennai, Kolkata, Mumbai, New Delhi	
UTC+05:45	Kathmandu	
UTC+06:00	Astana	
UTC+06:00	Dhaka	
UTC+06:00	Novosibirsk (RTZ 5)	○
UTC+06:30	Yangon (Rangoon)	
UTC+07:00	Krasnoyarsk (RTZ 6)	○
UTC+07:00	Bangkok, Hanoi, Jakarta	
UTC+08:00	Irkutsk (RTZ 7)	
UTC+08:00	Ulaanbaatar	○
UTC+08:00	Kuala Lumpur, Singapore	
UTC+08:00	Perth	○

Time zone		DST
UTC+08:00	Taipei	
UTC+08:00	Beijing, Chongqing, Hong Kong SAR, Urumqi	
UTC+09:00	Seoul	
UTC+09:00	Yakutsk (RTZ 8)	○
UTC+09:00	Osaka, Sapporo, Tokyo	
UTC+09:30	Adelaide	○
UTC+09:30	Darwin	
UTC+10:00	Vladivostok, Magadan (RTZ 9)	○
UTC+10:00	Canberra, Melbourne, Sydney	○
UTC+10:00	Guam, Port Moresby	
UTC+10:00	Brisbane	
UTC+10:00	Hobart	○
UTC+10:00	Magadan	
UTC+11:00	Solomon Islands, New Caledonia	
UTC+11:00	Chokurdakh (RTZ 10)	
UTC+12:00	Anadyr, Petropavlovsk-Kamchatsky (RTZ 11)	
UTC+12:00	Auckland, Wellington	○
UTC+12:00	Fiji	
UTC+12:00	Coordinated Universal Time+12	
UTC+13:00	Samoa	○
UTC+13:00	Nuku'alofa	
UTC+14:00	Christmas Island	

---

# Function Settings

Configure initial settings for patient information, input signals, and other functions.

- 1 Select [Function Settings] in the [System Admin Settings] screen, and press the ENTER button.

The [Function Settings] screen appears.

- 2 Select a tab, and press the ENTER button.

- 3 Configure the settings in each tab as necessary.

For details on each tab, see the following.

*[Patient Info.] Tab (page 59)*

*[Input Detection] Tab (page 59)*

*[Input Signal] Tab (page 59)*

*[Auto Live] Tab (page 59)*

*[General 1] Tab (page 60)*

*[General 2] Tab (page 61)*

*[Facility] Tab (page 61)*

*[CMS] Tab (page 61)*

- 4 When you finish configuration, select [Apply] and press the ENTER button.

The configurations are saved, and the [System Admin Settings] screen appears again.

---

## [Patient Info.] Tab

Configure initial settings for patient information.

### [Patient ID Length]

Select the number of digits to use for patient IDs.

You can select from 4 to 16 digits.

The default setting is [8].

### [Add 0 to Patient ID]

Select whether to add zeros to patient IDs with less than the specified number of digits.

The default setting is [Use].

### [Patient Name Field]

Select the number of display fields to use for the patient name.

If you select [2] or [3], the patient name field will be separated into first, middle, and last names.

The default setting is [1].

### [Change Patient Info.]

Select whether to allow changes to patient information at any time.

The default setting is [Not Used].

---

## [Input Detection] Tab

Configure the detection method for input signals.

### [2D/3D]

Select whether to recognize the 2D/3D format of input signals automatically or whether to specify it manually.

The default setting is [Auto].

### [Color Gamut]

Select whether to recognize the color gamut of input signals automatically or whether to specify it manually.

The default setting is [Auto].

---

## [Input Signal] Tab

Configure initial settings for input signals.

### [Region]

You can select from [NTSC] and [PAL].

The default setting is [NTSC].

### [I/O Timing]

Select from [Normal] or [Pass-Through] for the input and output timing.

Select [Normal] as signal processing is usually performed under normal circumstances. There will be a slight delay in signal outputs when [Normal] is selected.

Select [Pass-Through] for simultaneous input and output timing without signal processing.

The default setting is [Normal].

### [Input Detect Duration]

Select from 0 to 3 seconds for the duration for which input signals are detected.

The default setting is [3 sec].

### Note

Image distortion may occur if a duration of 2 seconds or less is selected.

### [3D Line by Line Signal]

When inputting 3D line-by-line signals, select [L First] (left image) or [R First] (right image) for the first line.

The default setting is [L First].

---

## [Auto Live] Tab

Configure initial settings for the auto live function.

### [Auto Live]

Select whether to use the auto live function.

When the auto live function is enabled and you capture a still image, the captured image is displayed for the duration specified with the [Duration] setting of [Auto Live Settings].

When using the auto live function, you can select the number of images to display during use ([Single] or [Multi]).

When [Multi] is selected, three or four captured images are displayed according to the display position setting. The default setting is [Not Used].

*[Advanced] appears when [Single] or [Multi] is selected. For details on this setting, see “To configure auto live settings” (page 60).*

#### Tip

If [Auto Live] is set to [Use] while [I/O Timing] is set to [Pass-Through], the auto live function will not function.

### [Auto Live Still Image]

Displays the type of image that is displayed when a video is paused while using the auto live function.

This is [Frame] on this unit.

## To configure auto live settings

Configure display duration and position settings for the captured images that are displayed when using the auto live function.

- 1 Select [Advanced], and press the ENTER button.

The [Auto Live Settings] screen appears.

- 2 Configure each setting.

#### [Duration]

Select the duration for which captured still images are displayed.

When [Single] is selected, select from 0.5 to 2 seconds for the duration. The default setting is [0.5 sec].

When [Multi] is selected, select from 1 to 5 seconds for the duration. The default setting is [3 sec].

#### [Position]

Select from [Top], [Bottom], [Left], and [Right] for the position in which captured still images are displayed.

The default setting is [Left].

The four most recent still images are displayed when [Top] or [Bottom] is selected, and the three most recent still images are displayed when [Left] or [Right] is selected.

- 3 When you finish configuration, select [Apply] and press the ENTER button.

The [Auto Live] tab appears again.

---

## [General 1] Tab

Configure initial system settings.

### [Show Status]

Select the check box for the status you want to display. You can select from [Rec Status], [Play Status], and [Idle Status].

None of the check boxes are selected under default settings.

#### Tip

If [Show Rec Status] or [Show Idle Status] is set to [Use] while [I/O Timing] is set to [Pass-Through], the status information will not be displayed. In addition, status information will not be updated during the auto live function.

### [Image List Display]

Select the category of thumbnails to display for videos in the [Image List] screen.

The default setting is [Title].

*For details on [Advanced] settings, see “To configure advanced image list settings” (page 60).*

### [Auto Eject BD/DVD]

Select whether to automatically eject BD/DVD discs when they are full.

The default setting is [Not Used].

### [Prohibit Remote Control]

Select whether to prohibit control of the unit via the remote control buttons.

The default setting is [Not Used].

### [Menu Display (SDI)]

Select whether to use the output of SDI output connector D exclusively for displaying menus and other screens.

The default setting is [Not Used].

#### Tip

If [Menu Display (SDI)] is set to [Use], input images from SDI output connectors A to D will not be displayed and black screens will be output instead.

## To configure advanced image list settings

Specify the selection state of recorded data when you perform copy or print operations in the [Image List] screen.

- 1 Select [Advanced] for [Image List Display], and press the ENTER button.

The [Advanced] settings screen appears.

- 2 Configure each setting, select [Apply] and press the ENTER button.

#### [Save to]

Select the selection state of recorded data when [Save to] is selected in the operation box.

You can select from [Deselect All], [Select All], [Video], and [Still].

The default setting is [Deselect All].

#### [Print]

Select the selection state of recorded data when [Print] is selected in the operation box.

You can select from [Deselect All] and [Still].

The default setting is [Deselect All].

---

## [General 2] Tab

Configure initial system settings.

#### [Recovery]

Select whether to return to the action that was being performed when a recovery operation was executed.

The default setting is [Use].

Recovery of recorded data is the only action performed when [Not Used] is selected.

#### [Automatic Pause]

Select whether to automatically pause recording when there is no input signal.

The default setting is [Not Used].

If you select [Use], recording will pause if there is no input signal for 10 minutes.

#### [Mic Plug-In Power]

Select the voltage to use when supplying power to the microphone from the unit.

You can select from [2.5V], [3.2V], and [4.2V].

This item is available when [Mic Plug-In Power] is set to [Use] in the [User Settings] screen – [Select Input] tab.

The default setting is [2.5V].

#### [LCD Backlight Adjust]

Select the brightness of the front panel display.

You can select from [25%], [50%], [75%], and [100%].

The default setting is [75%].

---

## [Facility] Tab

Configure initial settings for the facility.

#### [Facility Name]

Enter up to 32 characters for the facility name.

Use only alphanumeric characters, underscores (\_), hyphens (-), and spaces.

#### [Display Logo]

Select whether to display a logo in the [MENU] screen. The default setting is [Not Used].

If you want to set [Display Logo] to [Use], be sure to import the logo.

*For details on importing, see “To import a logo” (page 61).*

## To import a logo

Import the logo file you want to display.

- 1 Copy the logo file onto a USB memory device, and insert the device into a USB port 1 on the front panel of the unit.
- 2 Select [Import], and press the ENTER button.
- 3 Press the ENTER button when the message that requests media to be inserted appears.

When import of the logo file is complete, a notification message will appear.

## To prepare a logo file

To display a logo, prepare a logo file that can be imported to the unit and copy it onto a USB memory device beforehand.

- 1 Prepare the logo file.

The logo file must meet the following conditions.

  - File format: 24-bit bitmap
  - File name: MenuLogo.bmp
  - Size: 43 (height) × 400 (width) pixels
  - Background: RGB (102, 102, 102) (gray)
- 2 Copy the logo file onto a USB memory device.

Create a folder with the following name in the uppermost directory of the USB memory device, and copy the logo file.

Folder name: DisplayLogo

---

## [CMS] Tab

Configure initial settings for the CMS mode. The CMS mode is used for transferring recorded data to the content management system.

#### [CMS Mode]

Select whether to use the CMS mode.

The default setting is [Not Used].

## Tip

For details on the content management system, contact your local Sony representative.

---

# Device Settings

Configure settings for external devices.

- 1 Select [Device Settings] in the [System Admin Settings] screen, and press the ENTER button.

The [Device] screen appears.

- 2 Select a tab, and press the ENTER button.

- 3 Configure the settings in each tab as necessary.

For details on each tab, see the following.

*[Device 1] Tab (page 62)*

*[Device 2] Tab (page 64)*

*[Control] Tab (page 64)*

- 4 When you finish configuration, select [Apply] and press the ENTER button.

The configurations are saved, and the [System Admin Settings] screen appears again.

---

## [Device 1] Tab

Configure settings for the USB devices connected to the unit.

*For details on devices that can be connected to the unit, contact your local Sony representative.*

### [USB 3] to [USB 6]

Select the devices connected to USB ports 3 to 6 on the rear panel of the unit.

The available settings include devices that are compatible with the unit.

The default setting is [No Device].

If you select a printer, be sure to configure the [Printer Settings].

*For details on this setting, see “To configure printer settings” (page 63).*

## Tips

- The unit can recognize the Sony UP-DR80MD printer automatically. To have the unit recognize UP-DR80MD printers automatically, set the USB port to which the printer will be connected to [No Device] in the device settings. Be aware that the printer will not be recognized automatically while recording or playback

is in progress or while the [Device Settings] screen is displayed.

- If the USB port to which a card reader is connected is changed while the unit is turned on, the card reader will not be recognized. In such cases, restart the unit.

If you selected [Bar Code Reader] or [Card Reader], be sure to configure the [Reader Settings].

*For details on this setting, see “To configure reader settings” (page 64).*

If you selected [Touch Panel / Mouse], be sure to configure the [Touch Panel / Mouse Settings].

*For details on this setting, see “Configuring Touch Panel / Mouse Settings” (page 75).*

## To configure printer settings

When a UP-DR80MD is selected, configure the color balance, brightness, and other settings.

- 1 Select [Advanced] for the USB port to which the UP-DR80MD is connected, and press the ENTER button.

[Advanced] appears when one of [USB 3] to [USB 6] is set to [UP-DR80MD].

The [Printer Settings] screen appears

- 2 Display the [Color Balance] tab, and adjust the color balance for cyan, magenta, and yellow and red, green, and blue.

You can specify a value between -32 to +32 for each color.

- 3 Display the [Gray Balance] tab, and adjust the balance for achromatic colors.

You can specify a value between -50 to +50 for the X and Y values.

- 4 Display the [Bright] tab, and configure the [Sharpness], [Dark], [Gamma], and [Light] settings to adjust the brightness of printed images.

You can specify a value between -3 to +3 for [Sharpness], and a value between -32 to +32 for [Dark], [Gamma], and [Light].

- 5 Display the [Import] tab, and import a watermark file or logo file.

### [Import Watermark]

Import a watermark file.

Copy the watermark file onto a USB memory device, and insert the device into a USB port on the unit.

*For details on preparing a watermark file, see “To prepare a watermark file” (page 63).*

When you select [Import Watermark] and press the ENTER button, a message requesting that you insert media appears. Select [OK] and press the ENTER button.

When import of the watermark file is complete, a notification message will appear.

### [Import Logo]

Import a logo file.

Copy the logo file onto a USB memory device, and insert the device into a USB port on the unit.

*For details on preparing a logo file, see “To prepare a logo file” (page 64).*

When you select [Import Logo] and press the ENTER button, a message requesting that you insert media appears. Select [OK] and press the ENTER button. When import of the logo file is complete, a notification message will appear.

- 6 When you finish configuration, select [Apply] and press the ENTER button.

The configurations are saved, and the [Device 1] tab appears again.

## To prepare a watermark file

To print watermarks, prepare a watermark file that can be imported to the unit and copy it onto a USB memory device beforehand.

- 1 Prepare the watermark file.

The watermark file must meet the following conditions.

- **For A4 size paper**

File format: 24-bit bitmap

File name: watermark\_A4.bmp

Size: 2392 × 3400 pixels

Color:

Background: RGB (255, 255, 255) (white)

Watermark: RGB (0, 0, 0) (black)

- **For letter size paper**

File format: 24-bit bitmap

File name: watermark\_85x11.bmp

Size: 2464 × 3192 pixels

Color:

Background: RGB (255, 255, 255) (white)

Watermark: RGB (0, 0, 0) (black)

- 2 Copy the watermark file onto a USB memory device.

Create a folder with the following name in the uppermost directory of the USB memory device, and copy the watermark file.

Folder name: Watermark

### To prepare a logo file

To print logos, prepare a logo file on the unit and copy it onto a USB memory device beforehand.

- 1 Prepare the logo file.

The logo file must meet the following conditions.

File format: 24-bit bitmap

File name: printlogo\_UP-DR80MD.bmp

Size: 94 (height) × 900 (width) pixels

- 2 Copy the logo file onto a USB memory device.

Create a folder with the following name in the uppermost directory of the USB memory device, and copy the logo file.

Folder name: PrintLogo

### To configure reader settings

If you selected [Bar Code Reader] or [Card Reader], configure the settings for reading data. The procedure for configuring barcode reader and card reader settings is the same.

- 1 Select [Advanced] for the USB port to which the barcode reader or card reader is connected, and press the ENTER button.

[Advanced] appears when [Bar Code Reader] or [Card Reader] is selected.

The [Reader Settings] screen appears.

- 2 Display the [Patient ID/Name] tab, and configure each setting.

#### [Patient ID]

Specify the starting position and length for the patient ID.

#### [Patient Name]

Specify the starting position and length for the patient name.

- 3 Display the [Gender/DOB] tab, and configure each setting.

#### [Gender]

Specify the starting position, male, and female for the gender.

#### [Birth Date]

Specify the starting position for the date of birth and the date format.

You can select from [YYYY/MM/DD], [MM/DD/YYYY], [DD/MM/YYYY], [YYYYMMDD], [MMDDYYYY], and [DDMMYYYY], or leave the field empty for the date format.

- 4 Scan the card.

The data from the card appears in the [Read Data] area of the [Decode] tab.

#### Tip

If there is an empty field within the data, an asterisk (\*) appears on the display.

- 5 Select [Decode], and press the ENTER button.

The decoding results are displayed in the [Decode] tab.

- 6 After confirming that the decoding results are correct, select [Apply] and press the ENTER button.

The configurations are saved, and the [Device 1] tab appears again.

---

## [Device 2] Tab

Configure settings for the printer and keyboard connected to the unit.

#### [Printer Used]

Select the printer to be used.

This is fixed at [UP-DR80MD] on this unit.

#### [Keyboard Mode]

Select whether to use the soft keyboard (i.e., on-screen keyboard) or a hard keyboard in the [Recording Preparation] screen.

The default setting is [Soft Keyboard].

*You can configure function key settings in [Advanced]. For details, see "Using Function Keys" (page 35).*

---

## [Control] Tab

Configure settings related to performing system controls for the unit and monitor controls from an external device.

#### [USB 7]

Specify the device connected to USB port 7.

The default setting is [No Device].

If you selected [System Control], you can verify the transmission speed under [System Control Setting].

For details on verifying the setting, see “To configure system control settings” (page 65).

### [RS-232C]

Specify the device connected to the RS-232C connector. The default setting is [No Device].

If you selected [System Control], be sure to configure the transmission speed under [System Control Setting].

For details on this setting, see “To configure system control settings” (page 65).

If you selected [Monitor], the monitor’s input will change as follows.

- When displaying the unit’s menu screens or similar displays, ports A to C on the monitor will change to SDI 2, even if they were originally set to HDMI.
- When closing the unit’s menu screens or playing back images, ports A to C on the monitor will change to HDMI, even if they were originally set to SDI 2.

### Tips

- The [Monitor] setting is disabled in touch panel mode.
- [Advanced] appears when [Monitor] is selected. However, the setting under [System Control Setting] will be fixed (i.e., the transmission speed will be fixed at 38400 bps).

### [Remote Startup]

Select whether to link the power on/off operations of remote systems via USB port 7 and the RS-232C connector.

The default setting is [Do Not Start].

When [USB 7] or [RS-232C] is selected, the remote system’s on/off operation will be linked to that of the unit via the selected connector.

## To configure system control settings

Display or configure the transmission speed when performing system controls via USB port 7 or the RS-232C connector.

- 1 Select [Advanced] for [USB 7] or [RS-232C], and press the ENTER button.

[Advanced] appears when [USB 7] or [RS-232C] is set to [System Control].

The [System Control Setting] screen appears.

- 2 Select the transmission speed, select [Apply] and press the ENTER button.

For USB port 7, the transmission speed is fixed at 115200 bps.

For the RS-232C connector, you can select from 9600 bps, 19200 bps, 38400 bps, 57600 bps, and 115200 bps for the transmission speed.

The default setting is [9600 bps].

### Tip

When [RS-232C] is set to [Monitor], the transmission speed is fixed at 38400 bps.

The configurations are saved, and the [Control] tab appears again.

## [Contact Switch] Tab

Configure these settings when you want to control the unit via contact switch devices connected to the contact switch connectors on the rear panel of the unit.

- 1 Select the control items for [Contact Switch 1] to [Contact Switch 3].

Specify what will be controlled via the contact switch device for each contact switch.

The procedure for configuring [Contact Switch 1] to [Contact Switch 3] is the same.

The default setting is [Not Used].

### [Not Used]

Disable use of the contact switch device.

### [Record Video/Pause]

Control pause and resume functions while recording videos.

### [Record Still]

Capture still images.

### [Audio On/Off]

Enable or disable audio output.

### [Set Index]

Add an index without saving a still image of the recording.

- 2 Select [Advanced] for the contact switch that will perform the control, and press the ENTER button.

The [Advanced] settings screen appears.

- 3 Specify the control timing, select [Apply] and press the ENTER button.

You can select from [Falling Edge], [Leading Edge], and [State].

The default setting is [Falling Edge].

[State] cannot be selected when the control item is set to [Record Still] or [Set Index].

### Tip

The pause control of the [Record Video/Pause] function will not operate immediately after recording starts. Wait about 5 seconds before performing the control.

The [Contact Switch] tab appears again.

---

## Password Settings

Configure password settings to prevent unauthorized changes to the [System Admin Settings]. When password protection is enabled, a password entry screen appears when [System Admin Settings] is selected in the [Settings] screen.

### Note

The password is not configured under default conditions. When configuring the password for the first time, configure the new password in the [Change Password] screen without entering an old password. Be sure to write down the password in case you forget it. The [System Admin Settings] cannot be accessed without the password. Guard the password securely to maintain security.

### To enable password protection

- 1 Select [Password Settings] in the [System Admin Settings] screen, and press the ENTER button.  
The [Password Settings] screen appears.
- 2 Select the password lock box, and press the ENTER button.
- 3 Select [Use], and press the ENTER button.  
The default setting is [Not Used].
- 4 Select [Settings], and press the ENTER button.  
The configuration is saved.

### To change the password

- 1 Select [Change] in the [Password Settings] screen, and press the ENTER button.  
The [Change Password] screen appears.
- 2 Configure each setting, select [Apply] and press the ENTER button.

#### [Old Password]

Enter the old password.

#### [New Password]

Enter up to 255 characters for the new password. Any character that can be entered on the on-screen keyboard can be used in the password.

### **[Check New Password]**

Reenter the new password.

The new password is saved.

---

## **Network Settings**

Configure initial settings for the network and server.

- 1** Select [Network Settings] in the [System Admin Settings] screen, and press the ENTER button.

The [Network Settings] screen appears.

- 2** Select a tab, and press the ENTER button.

- 3** Configure the settings in each tab as necessary.

For details on each tab, see the following.

*[Network] Tab (page 67)*

*[IP Address] Tab (page 67)*

*[DNS Server] Tab (page 68)*

*[File Server] Tab (page 68)*

*[Shared] Tab (page 68)*

*[NTP] Tab (page 68)*

- 4** When you finish configuration, select [Apply] and press the ENTER button.

The configurations are saved, and the [System Admin Settings] screen appears again.

---

### **[Network] Tab**

Configure these settings when using a network.

#### **[Network]**

Select whether to use a network.

The default setting is [Not Used].

If you selected [Use], configure the settings in each tab as necessary.

---

### **[IP Address] Tab**

#### **[Obtain an IP address automatically]**

Select [Use] to use the DHCP to obtain an IP address automatically, or select [Not Used] to assign a static IP address manually.

If you selected [Use], the IP address, subnet mask, and default gateway will be displayed as read-only.

If you selected [Not Used], be sure to configure the [IP Address], [Subnet Mask], and [Default Gateway] settings.

**[IP Address]**

Enter the IP address.

**[Subnet Mask]**

Enter the subnet mask.

**[Default Gateway]**

Enter the IP address for the default gateway.

If you are only using a local network and not connecting to other networks, do not configure this setting.

---

**[DNS Server] Tab****[Obtain DNS server address automatically]**

Select [Use] to obtain the IP address for the DNS server automatically, or select [Not Used] to specify the IP address manually.

If you selected [Not Used], be sure to configure the [Preferred DNS server] and [Alternate DNS server] settings.

**[Preferred DNS server]**

Enter the IP address for the preferred DNS server.

If you do not have nor need a preferred DNS server, do not configure this setting.

**[Alternate DNS server]**

Enter the IP address for the alternate DNS server.

If you do not have nor need an alternate DNS server, do not configure this setting.

---

**[File Server] Tab**

Configure these settings when specifying a server as the storage destination for recorded data.

**[Server]**

Select [Common Setting (Share)] to specify a server as the storage destination.

The default setting is [Not Used].

If you selected [Common Setting (Share)], be sure to configure the share name and other settings in the [Shared] tab.

*For details on this setting, see “[Shared] Tab” (page 69).*

**[Server Name]**

Enter the server name.

**[Share Name]**

Enter the share name.

Use only alphanumeric characters and symbols (excluding " = / \ [ ] : | < > + ; , ? \*).

---

**[Shared] Tab**

Configure the necessary settings for using a server as the storage destination.

**[User Name]**

Enter a user name.

**[Password]**

Enter the password.

---

**[NTP] Tab**

Configure these settings to obtain the current time from the NTP server.

**[NTP]**

Select [Use] to obtain the current time from the NTP server.

The default setting is [Not Used].

If you selected [Use], be sure to configure the [Address] and [Port No.] settings.

**[Address]**

Enter the address for the NTP server.

**[Port No.]**

Enter the port number.

The default setting is [123].

---

# Doctor List Registration

Register doctor names and initial settings for each doctor. The doctor information registered here will be used in the doctor lists and default settings that appear in other screens. You can register up to 100 doctors.

---

## Registering Doctors

- 1 Select [Edit Doctor List] in the [System Admin Settings] screen, and press the ENTER button.

The [Edit Doctor List] screen appears.

- 2 Select [Add], and press the ENTER button.

The [Add Doctor] screen appears.

- 3 Select a tab, and press the ENTER button.

- 4 Configure the settings in each tab as necessary.

For details on each tab, see the following.

*[General] Tab (page 69)*

*[File Server] Tab (page 69)*

*[Shared] Tab (page 69)*

*[Print] Tab (page 69)*

*[External Media] Tab (page 70)*

- 5 When you finish configuration, select [Add] and press the ENTER button.

The doctor information is added.

---

## [General] Tab

Configure general settings such as the doctor name and storage destination.

### [No.]

Displays the doctor number.

A sequential number is assigned automatically and cannot be changed.

### [Name]

Enter up to 64 characters for the doctor name.

### [Video Quality]

Select the video recording quality.

You can select from [Best], [High], and [Standard].

### [External Media]

Select the external storage media that will be used during simultaneous recording.

You can select from [Not Specified], [Auto-Detect], [BD/DVD], [USB 1], [USB 2], and [SERVER].

---

## [File Server] Tab

Configure these settings when specifying a server as the storage destination.

### [Server]

Select [System Settings] or [Share (CIFS)] for the server type.

The default setting is [Not Used].

If you selected [Share (CIFS)], be sure to configure the necessary settings in the [Shared] tab, in addition to the [Server Name].

*For details on this setting, see “[Shared] Tab” (page 69).*

### [Server Name]

Enter the server name.

### [Share Name]

Enter the share name.

Use only alphanumeric characters and symbols (excluding " = / \ [ ] : | < > + ; , ? \*).

---

## [Shared] Tab

Configure the necessary settings for when [Server] is set to [Share (CIFS)] in the [File Server] tab.

### [User Name]

Enter a user name.

### [Password]

Enter the password.

---

## [Print] Tab

### [Printer]

Displays the name of the connected printer.

### [Layout]

Select the number of still images to print on each sheet.

To use the system settings, select [User Settings].

For the portrait orientation

You can select from 1 image (1 × 1), 2 images (1 × 2), 4 images (2 × 2), 6 images (2 × 3), 8 images (2 × 4), 9 images (3 × 3), 12 images (3 × 4), 15 images (3 × 5), or 18 images (3 × 6).

The default setting is [User Settings].

For the landscape orientation

You can select from 1 image (1 × 1), 2 images (2 × 1), 4 images (2 × 2), 6 images (3 × 2), 8 images (4 × 2), 9 images (3 × 3), 12 images (4 × 3), 15 images (5 × 3), or 18 images (6 × 3).

The default setting is [User Settings].

---

## [External Media] Tab

Configure save settings for videos and still images.

### [Save Video]

Select the check box of the format in which videos will be saved.

All of the check boxes are selected under default settings.

### [Save Still]

Select the check box of the format in which still images will be saved.

All of the check boxes are selected under default settings.

---

## Editing the Doctor List

- 1 Select [Edit Doctor List] in the [System Admin Settings] screen, and press the ENTER button.

The [Edit Doctor List] screen appears.

- 2 Edit the doctor information.

*Sorting the Doctor List (page 70)*

*Editing Doctor Settings (page 70)*

*Deleting Doctors (page 71)*

- 3 Select [Settings], and press the ENTER button.

The configurations are saved, and the [System Admin Settings] screen appears again.

---

## Sorting the Doctor List

- 1 Select the doctor you want to reposition in the [Edit Doctor List] screen, select [Up] or [Down], and then press the ENTER button.

The doctor entry moves up or down one position at a time.

---

## Editing Doctor Settings

- 1 Select the doctor for which you want to change settings in the [Edit Doctor List] screen, select [Edit], and then press the ENTER button.

The [Edit Doctor] screen appears.

- 2 After editing the settings, select [Apply] and press the ENTER button.

The configuration is saved.

*For details on each setting, see the following.*

*[General] Tab (page 69)*

*[File Server] Tab (page 69)*

*[Shared] Tab (page 69)*

*[Print] Tab (page 69)*

*[External Media] Tab (page 70)*

## Note

If you change the doctor name, you will not be able to use the previous doctor name to search for recorded data attributed to that name.

---

## Deleting Doctors

- 1 Select the doctor you want to delete in the [Edit Doctor List] screen, select [Delete], and then press the ENTER button.
- 2 Select [OK] when the confirmation message appears, and press the ENTER button.

The doctor entry is deleted.

---

## Editing Cases

Edit cases and categories for surgical procedures and examinations, and create the list of cases that will be used in the various screens.

- 1 Select [Edit Case List] in the [System Admin Settings] screen, and press the ENTER button.  
The [Edit Case List] screen appears.
- 2 Edit the case information.  
*Registering Cases (page 71)*  
*Deleting Cases (page 71)*  
*Sorting the Case List (page 72)*  
*Editing Case Names (page 72)*  
*Registering Categories (page 72)*  
*Selecting Categories (page 72)*  
*Editing Categories (page 72)*
- 3 Select [Apply] in the [Edit Case List] screen, and press the ENTER button.  
The configurations are saved, and the [System Admin Settings] screen appears again.

---

## Registering Cases

Up to 100 case entries can be registered for a single category.

- 1 Select [Add] in the [Case] area of the [Edit Case List] screen, and press the ENTER button.  
The [Add] screen appears.
- 2 Enter up to 20 characters for the case name, select [Add], and then press the ENTER button.  
The case is added to the list in the [Edit Case List] screen.

---

## Deleting Cases

- 1 Select the case you want to delete in the [Edit Case List] screen, select [Delete] in the [Case] area, and then press the ENTER button.

- 2 Select [OK] when the confirmation message appears, and press the ENTER button.

---

## Sorting the Case List

- 1 Select the case you want to reposition in the [Edit Case List] screen, select [Up] or [Down] in the [Case] area, and then press the ENTER button.

The case entry moves up or down one position at a time.

---

## Editing Case Names

- 1 Select the case you want to rename in the [Edit Case List] screen, select [Edit] in the [Case] area, and then press the ENTER button.

The [Edit] screen appears.

- 2 Rename the case, select [Apply], and then press the ENTER button.

The configurations are saved, and the [Edit Case List] screen appears again.

---

## Registering Categories

- 1 Select [Edit] in the [Category] area of the [Edit Case List] screen, and press the ENTER button.

The [Edit Category List] screen appears.

- 2 Select [Add], and press the ENTER button.

The [Add] screen appears.

- 3 Enter up to 20 characters for the category name, select [Add], and then press the ENTER button.

A sequential number is assigned to [No.] automatically and cannot be changed.

- 4 When you finish configuration, select [Apply] and press the ENTER button.

The configurations are saved, and the [Edit Category List] screen appears again.

## To delete a category

- 1 Select the category you want to delete in the [Edit Category List] screen, select [Delete], and then press the ENTER button.

- 2 Select [OK] when the confirmation message appears, and press the ENTER button.

### Tip

If you delete a category, all procedures registered to that category will also be deleted.

---

## Selecting Categories

- 1 Select the box in the [Category] area of the [Edit Case List] screen, and press the ENTER button.

The case category selection screen appears.

- 2 Select the case category, and press the ENTER button.

The configurations are saved, and the [Edit Case List] screen appears again.

---

## Editing Categories

- 1 Select [Edit] in the [Category] area of the [Edit Case List] screen, and press the ENTER button.

The [Edit Category List] screen appears.

- 2 Edit the categories.

*Sorting the Category List (page 72)*

*Editing Category Names (page 73)*

- 3 Select [Apply] in the [Edit Category List] screen, and press the ENTER button.

The [Edit Case List] screen appears again.

---

## Sorting the Category List

- 1 Select the category you want to reposition in the [Edit Category List] screen, select [Up] or [Down], and then press the ENTER button.

The category moves up or down one position at a time.

---

## Editing Category Names

- 1 Select the category you want to rename in the [Edit Category List] screen, select [Edit], and then press the ENTER button.

The [Edit] screen appears.

- 2 Rename the category, select [Apply], and then press the ENTER button.

The configurations are saved, and the [Edit Category List] screen appears again.

---

## Auto Delete Settings

Select whether to use the auto delete function, and configure the threshold value that will be used for the function.

- 1 Select [Auto Delete] in the [System Admin Settings] screen, and press the ENTER button.

The [Auto Delete Setting] screen appears.

- 2 Configure each setting, select [Apply] and press the ENTER button.

### **[Auto Delete]**

Select whether to use the auto delete function. The default setting is [Use].

### **[Auto Delete Value]**

Select the threshold value that will be used for the auto delete function.

You can select from [10%], [20%], and [30%]. The default setting is [10%].

The configuration is saved.

---

# DICOM Settings

Configure settings that are necessary for DICOM transmissions of still images.

- 1 Select [DICOM Settings] in the [System Admin Settings] screen, and press the ENTER button.

The [DICOM Settings] screen appears.

- 2 Select a tab, and press the ENTER button.

- 3 Configure the settings in each tab as necessary.

For details on each tab, see the following.

*[Server] Tab (page 74)*

*[Local Station 1] Tab (page 74)*

*[Local Station 2] Tab (page 74)*

- 4 When you finish configuration, select [Apply] and press the ENTER button.

The configurations are saved, and the [System Admin Settings] screen appears again.

---

## [Local Station 2] Tab

Configure local station settings.

### [SOP Class UID]

Select [SC] or [VL] for the SOP Class UID.

The default setting is [SC].

### [Character Set]

Select the character set.

You can select from [IR6], [IR13], [IR100], and [IR101].

The default setting is [IR6].

---

## [Server] Tab

Configure these settings when DICOM transmissions will be performed.

### [DICOM]

Select whether to use DICOM.

Select [Use] to perform DICOM transmissions.

The default setting is [Not Used].

### [Server Name]

Enter the server name.

Up to 255 characters can be entered.

### [Port No.]

Enter the port number.

The default setting is [104].

### [AE Title]

Enter the AE title.

Up to 128 characters can be entered.

---

## [Local Station 1] Tab

Enter up to 128 characters for [AE Title], [Station Name], [Facility Name], and [Facility Address].

## Overview

You can connect a commercially available touch panel monitor or mouse to the unit, and use them to operate the menu screens.

This chapter describes the settings for using a touch panel monitor or mouse, and the screens that appear during touch panel or mouse operations.

### Note

If you set one of [USB 3] to [USB 6] to [Touch Panel / Mouse] in the [System Admin Settings] screen – [Device Settings] screen – [Device 1] tab in the touch panel / mouse mode while a compatible device is not connected, operation will become impossible. Should you inadvertently disable operation, you can restore the standard operation mode by performing the following.

- 1 Connect a hard keyboard.
- 2 While holding the o key (lower case), press the ⏻ (on/standby) switch, and release the o key when the unit turns off.
- 3 Press the ⏻ (on/standby) switch to exit standby mode.

### Tips

- The minimum requirement for the touch panel monitor resolution is 1366 × 768.
- Be aware of the following when setting one of [USB 3] to [USB 6] to [Touch Panel / Mouse] in the [System Admin Settings] screen – [Device Settings] screen – [Device 1] tab.
  - You must restart the unit after applying the setting.
  - After applying the setting, the ▲, ▼, ◀, ▶, ENTER, and MENU buttons on the front panel of the unit and on the infrared remote control unit are disabled.
- For details on supported touch panel monitors, contact your local Sony representative.

## Configuring Touch Panel / Mouse Settings

Configure the following settings to enable use of a touch panel monitor or mouse.

- 1 Select [Device Settings] in the [System Admin Settings] screen, and press the ENTER button.

*For details on displaying the [System Admin Settings] screen, see “Displaying the [System Admin Settings] Screen” (page 56).*

The [Device] screen appears.

- 2 Display the [Device 1] tab, and set the USB port to which the touch panel monitor or mouse will be connected ([USB 3] to [USB 6]) to [Touch Panel / Mouse].
- 3 Select [Advanced], and press the ENTER button.  
The [Touch Panel / Mouse Settings] screen appears.
- 4 Set [Display Cursor] to [Use], select [Apply], and then press the ENTER button.

When [Use] is selected, a mouse cursor will appear on the screen while using touch panel mode or a mouse.

The default setting is [Not Used].

When you change this setting, a message indicating that you must restart the unit appears.

- 5 Connect the touch panel monitor or mouse, and follow the instructions on the screen and restart the unit.

# Screen Displays in Touch Panel / Mouse Mode

The screens that appear in touch panel / mouse mode differ slightly from those that appear in standard mode. This section describes the main differences in the screens and buttons that appear.

## [MENU] Screen



- 1 [Patient Info.]**  
Displays the patient ID, patient name, gender, and date of birth.
- 2 [New Folder]**  
Resets the patient information.  
**[Close Folder]**  
Use this to end recording, and display the [End Recording] screen.
- 3 [Recording Preparation] tab**  
Enter patient information and configure the storage destination for recorded data before starting to record.  
*For details on each setting, see “Recording Preparation” (page 43).*

### Tip

When entering the date of birth in the touch panel monitor screen, the year is entered via the on-screen keyboard.

- 4 [Recording] tab**  
Allows you to perform recording and playback controls for Ch2.

*For details on each setting, see “Recording Preparation” (page 43).*

### Tips

- Ch1 playback cannot be performed during Ch2 recording or playback.
  - Ch2 recording or playback cannot be performed during Ch1 playback.
- 5 [Change Settings] tab**  
Allows you to change the image quality and video input.  
*For details on each setting, see “Configuring Input Signal Settings” (page 31), “Configuring Image Quality Settings” (page 31), and “Configuring Recording Settings” (page 32).*
  - 6 [Link On] (Ch1/Ch2 link)**  
Use this to enable Ch1/Ch2 simultaneous recording. This button is disabled when recording for Ch1 or Ch2 is in progress.  
**On (green):** Recording and playback controls for Ch1 and Ch2 are linked.  
**Off (gray):** Ch1 and Ch 2 are not linked.

**7 [AUDIO] (Audio on/off)**

Use this to record audio.

**On (green):** Audio is recorded.

**Off (gray):** Audio recording is stopped.

**8 Status button**

Displays the “[Status] Screen” (page 77).

**9 [Recording List] button**

Displays the [Recording List] screen.

**10 HDD capacity / error indicator**

Displays the internal HDD’s remaining capacity under normal conditions.

If an error occurs, the error that appears on the front panel display also appears here.

**11 (on/standby) button**

Use this to set the unit to standby mode.

A confirmation message when you tap this.

**12 Control buttons**

Use these to control playback and recording.

The buttons function identically to the buttons on the front panel of the unit and on the infrared remote control unit.

For details, see “Names and Functions of Parts” (page 18).

**Tips**

- Ch1 playback cannot be performed during Ch2 recording or playback.
- Ch2 recording or playback cannot be performed during Ch1 playback.

**13 Ch1 image display and playback/recording status**

Displays the input image or playback image for Ch 1 and various playback/recording status indicators.

**Playback/recording counter:** Displays the playback or recording time in “0:00:00” format.

**Still capture count:** Displays the number of still images you captured in “CAP:001” format.

**Rec mode:** Displays the current recording mode.

**External media recording status:** Displays the recording status for each external media in “■ <media name> -h -m” format.

**Printer status:** Displays the print status and the remaining number of print sheets.

**Indicators:** The indicators light according to the status of the corresponding media or printer.

■ (gray): Operating normally.

■ (green): Data is being written or printing is in progress.

■ (orange): An error has occurred.

**14 [Input]**

This is enabled when [2D/3D] is set to [Manual] in the [System Admin Settings] screen – [Function Settings] screen – [Input Detection] tab. When [Auto] is selected, the input signal is automatically recognized and displayed here.

This configures the Ch1 input signal.

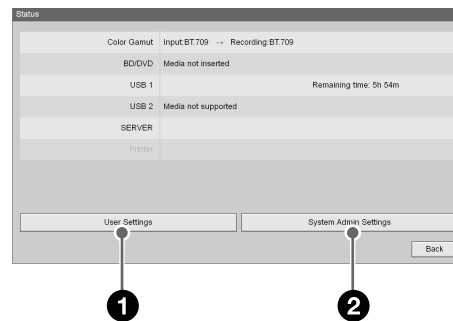
**[Ch1 Ext Storage]**

Configures the external storage destination for Ch1 recorded data.

---

## [Status] Screen

The [Status] screen displays the status of recording to external media, the conditions of connected devices, and other status information.



**1 [User Settings]**

Displays the [User Settings] screen.

For details, see “Displaying the [User Settings] Screen” (page 31).

**2 [System Admin Settings]**

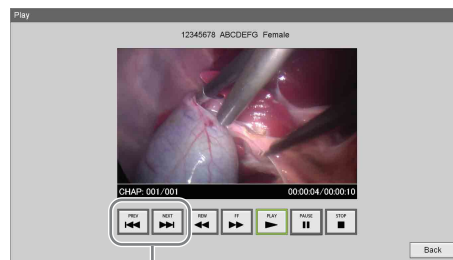
Displays the [System Admin Settings] screen.

For details, see “Displaying the [System Admin Settings] Screen” (page 56).

---

## Video Playback Screen

This screen appears during video playback. You can control playback using the buttons at the bottom.



Chapter forward/back buttons

## Tip

Ch1 video is played back during quick playback.

---

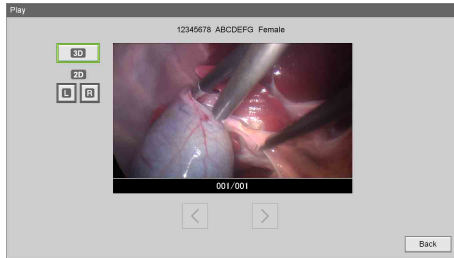
## Still Image Playback Screen

This screen appears during still image playback.

You can play back the still images in sequence using the buttons at the bottom.

To play back 3D still images, tap the 3D data button.

To playback the left and right 2D still images, tap the [L] and [R] buttons.



## Error Messages






When contacting your local Sony representative, please indicate the error message and error ID.

Front panel display		Description	Solution
Error message	Error ID		
SYSTEM ERR.	0100 to 0199	Motherboard error	Restart the unit. (The unit will restart automatically for error ID 0600 to 0699 capture board errors.) If the error persists, contact your local Sony representative.
SYSTEM ERR.	0200 to 0299	Internal HDD error	
SYSTEM ERR.	0300 to 0399	Database error	
SYSTEM ERR.	0400 to 0499	Recovery failure	
SYSTEM ERR.	0500 to 0599	File data error	
SYSTEM ERR.	0600 to 0699	Capture board error	
SYSTEM ERR.	0700 to 0799	Optical drive error	
SYSTEM ERR.	0800 to 0899	Audio device error	
SYSTEM ERR.	0900 to 0999	Front panel error	
SYSTEM ERR.	1000 to 1099	Application error	
SYSTEM ERR.	1101	Activation error	Activation failed. Contact your local Sony representative.
SYSTEM ERR.	1102	Update error	Firmware update failed. Contact your local Sony representative.
SYSTEM ERR.	1200 to 1299	LCD controller error	An LCD controller error has occurred. The unit will restart automatically. If the unit does not restart automatically, contact your local Sony representative.
MAX REC DATA	–	Limit for recorded data reached	The limit for the number of recorded data entries has been reached. Delete any unnecessary recorded data.
MAX CHAPTER	–	Limit for chapters reached	The limit for the number of chapters has been reached. Stop the recording operation.
MAX STILL IMAGE	–	Limit for still images reached	Delete any unnecessary still images.
NO RECORD	–	No recorded data	Recorded data for quick playback does not exist.
HDD LACK	–	Insufficient space on internal HDD	The remaining space on the internal HDD is low. Delete any unnecessary recorded data.

Front panel display		Description	Solution
Error message	Error ID		
HDD FULL	–	Internal HDD full	There is no remaining space on the internal HDD. Delete any unnecessary recorded data.
KEY INHIBIT	–	Front panel buttons disabled	Button operations on the unit's front panel are disabled.
WARN. FAN	–	System/CPU fan warning	A fan rotation malfunction has occurred. Contact your local Sony representative.
WARN. TEMP.	–	System/CPU temperature warning	An internal temperature error has occurred. Check your operating environment.
WARN. HDD	–	Internal HDD warning or error	An internal HDD error has occurred. Contact your local Sony representative.
ERR.BATTERY	–	Battery dead	The battery is dead. Contact your local Sony representative.
WARN.HDD.2	–	Corrupted files warning	Corrupted files exist on the internal HDD. Perform recovery on the internal HDD. For details on how to perform HDD recovery, see <i>"Troubleshooting"</i> (page 81). If the error persists, contact your local Sony representative.
WARN.DB1	–	Database damaged	The database is damaged. Perform recovery on the database. For details on how to perform database recovery, see <i>"Troubleshooting"</i> (page 81). If the error persists, contact your local Sony representative.
WARN.DB2	–		
HDD RECOVERING ...	–	HDD recovery in progress	Internal HDD recovery is in progress. Wait until recovery is complete.
DB1 RECOVERING...	–	Database recovery in progress	Database recovery is in progress. Wait until recovery is complete.
DB2 RECOVERING...	–		
ERR.HDD	–	Internal HDD error	An internal HDD error has occurred. Contact your local Sony representative.
ERR.SSD	–	SSD error	Contact your local Sony representative.
WARN LCD	–	LCD backlight warning	The LCD usage time has exceeded 10,000 hours. Contact your local Sony representative.
PLAYBACK ERR.	–	Playback failed	Perform the playback operation again. If the error persists, contact your local Sony representative.

# Troubleshooting

Be sure to check the following if a problem occurs. If the problem persists, contact your local Sony representative.

- The unit does not turn on when the  (on/standby) switch is pressed.
  - The main power switch on the rear panel of the unit is set to the  (off) position.  
Set the main power switch to the **I** (on) position (*page 20, 21*).
  - Make sure that the power cord is properly connected to the power outlet.
- The buttons on the unit do not function.  
Recording, playback, and other operations do not function properly.
  - Static electricity can have adverse effects on the functioning of the unit.  
Turn off the  (on/standby) switch, disconnect the power cord, and then wait a moment before reconnecting the power cord and turning on the unit.
- The disc tray does not open when the  EJECT button is pressed.
  - The disc tray may take a few seconds to open after you record data on the disc. This is because the unit is adding certain required information onto the disc. It is not a malfunction.
- The unit turns on, but images do not appear or are distorted.
  - Make sure that the cables are properly connected to the input/output connectors on the rear panel of the unit (*page 20*).
  - Make sure that the cables are not damaged.
- There is no audio, or the audio is noisy.
  - Make sure that the cables are properly connected to the input/output connectors on the rear panel of the unit (*page 20*).
  - Make sure that the cables are not damaged.
  - If the unit is in fast playback or fast reverse playback mode, press the  PLAY button (*page 19*).
- The unit cannot record data.
  - Use media on which data can be recorded.
  - The remaining storage capacity on the media is insufficient.  
Replace the media.
  - Use a BD/DVD disc that is compatible with the unit (*page 27*).
- The image freezes and audio is cut for brief (about one second) moments during playback.
  - This unit stops playback between titles, and resumes playback after about one second. It is not a malfunction.
- Data on the disc is damaged.
  - Contact your local Sony representative.
- “WARN.HDD.2” appears on the front panel display.
  - Corrupted files exist on the internal HDD. Press and hold the BACK button for at least 5 seconds to perform recovery on the internal HDD.
  - If the warning is displayed even after performing HDD recovery, the internal HDD is damaged. Contact your local Sony representative.

- “WARN.DB1” or “WARN.DB2” appears on the front panel display.
  - The database is damaged. Press and hold the BACK button for at least 5 seconds to perform database recovery.
  - If the warning is displayed even after performing database recovery, the database cannot be recovered. Contact your local Sony representative.

## Note

- Do not turn off the unit while internal HDD or database recovery is in progress. The recovery process will start after the unit automatically restarts.
- Internal HDD or database recovery can take up to 1 hour each. If recovery does not complete within 1 hour, the unit will automatically shut down.

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## Licenses

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### DCMTK

This product uses the OFFIS DICOM Toolkit DCMTK (C) 1993-2008, OFFIS e.V.

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### libjpeg

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

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### Package list

- DCMTK
- gSOAP
- Live555 Streaming Media

- Postgre SQL
- libjpeg
- LibTIFF
- zlib

The source code is provided on the Web. Access the following URL to download the code.

<http://www.sony.net./Products/Linux/>

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author Gnomovision comes with  
ABSOLUTELY NO  
WARRANTY; for details type  
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```
<one line to give the library's
name and a brief idea of what
it does.>
Copyright (C) <year> <name
of author>
```

```
This library is free software;
you can redistribute it and/or
modify it under the terms of
the GNU Lesser General
Public License as published
by the Free Software
Foundation; either version
2.1 of the License, or (at your
option) any later version.
```

```
This library is distributed in
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but WITHOUT ANY
WARRANTY; without even
the implied warranty of
MERCHANTABILITY or
FITNESS FOR A
PARTICULAR PURPOSE.
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```

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```
Yoyodyne, Inc., hereby
disclaims all copyright
interest in the library `Frob' (a
library for tweaking knobs)
written by James Random
Hacker.
```

```
<signature of Ty Coon>, 1
April 1990
Ty Coon, President of Vice
```

That’s all there is to it!

# Specifications

## Recording Features

- Recording Video Format
  - MPEG-4 AVC/H.264
- Recording Audio Format
  - LPCM, AAC LC
- Recording File Format
  - XAVC S, MP4
- Recording Media
  - Internal HDD (4TB)
  - External USB Storage
  - Network (CIFS)
  - DVD-R
  - BD-R/BD-R DL
  - BD-RE/BD-RE DL
- Input Resolution
  - 4096 × 2160
  - 3840 × 2160
- Recording Resolution
  - 3840 × 2160
  - 1920 × 1080
- Recording Bit Rate (4K)
  - 150 Mbps (Best)
  - 100 Mbps (High)
  - 60 Mbps (Standard)
- Recording Bit Rate (HD)
  - 24 Mbps (Best)
  - 18 Mbps (High)
  - 12 Mbps (Standard)

## Connectors

- Input Connectors
  - 3G-SDI (BNC type) (4)
  - AUDIO (Stereo mini jack) (1)
  - MIC (Stereo mini jack) (1)
  - AC Inlet (3-pin) (1)
- Output Connectors
  - 3G-SDI (BNC type) (4)
  - HDMI (Type A) (1)
  - AUDIO (Stereo mini jack) (1)
- Other Interfaces
  - USB 3.0 (Type A) (2)
  - USB 2.0 (Type A) (4)
  - USB 2.0 (Type B) (1)
  - Network (RJ-45, 1000 Base-T/100 Base) (1)
  - REMOTE RS-232C (D-sub 9-pin) (1)
  - REMOTE contact switch (stereo mini jack) (4)
  - Equipotential

## General

- Power Requirements
  - 100 V to 240 V AC, 50/60 Hz
- Input Current
  - 1.25 A to 0.52 A

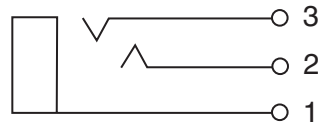
- Operating Temperature
  - 5 °C to 40 °C (41 °F to 104 °F)
- Operating Humidity
  - 20% to 80% (Maximum wet-bulb temperature: 30 °C (86 °F)) (no condensation)
- Operating Pressure
  - 700 hPa to 1,060 hPa
- Storage and Transport Temperature
  - 20 °C to +60 °C (-4 °F to +140 °F)
- Storage and Transport Humidity
  - 20% to 90% (Maximum wet-bulb temperature: 30 °C (86 °F)) (no condensation)
- Storage and Transport Pressure
  - 700 hPa to 1,060 hPa
- Mass
  - Approx. 6.5 kg (Approx. 14 lb. 5.3 oz.)
- Dimensions
  - 305.0 × 329.0 × 115.5 mm (12 1/8 × 13 × 4 5/8 in.) (W × D × H) (including longest protrusions)
- Supplied Items
  - Before Using This Unit (1)
  - CD-ROM (Instructions for Use, PROTOCOL MANUAL) (1)
  - Warranty booklet (1)
  - Service Contact List (1)
  - Infrared remote control unit (RM-M010) (1)
- Separately-Sold Accessories
  - Foot Switch (FS-24)

### Caution

The FS-24 has an Ingress Protection rating of IPx3. Therefore, do not operate it environments exposed to splashing liquids (e.g., surgical operating rooms). For safety, use a device with a rating of IPx6 or higher when operating in such environments.

## REMOTE contact switch connectors

Connector specifications (stereo mini jack)



- 1 GND
- 2 TRIGGER SIGNAL (TTL)  
If the status changes for at least 100 msec, the action configured in the REMOTE contact switch settings will start.
- 3 BUSY STATUS (TTL)  
HIGH level will be initiated according to the REMOTE contact switch settings.

Design and specifications are subject to change without notice.

## Medical Specifications

Protection against electric shock:

Class I

Protection against harmful ingress of water:

Ordinary

Degree of safety in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide:

Not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide

Mode of operation:

Continuous

### Notes

- Always make a test recording, and verify that it was recorded successfully.  
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Sony Corporation  
1-7-1 Konan Minato-ku Tokyo,  
108-0075 Japan

<http://www.sony.net/>